

Interlinks, conflicts and dependencies between chemicals, climate and circularity aspects in procurement

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Abbreviations

CCC	ChemClimCircle procurement, which integrates a toxic-free environment, climate neutrality and circularity objectives
EU	European Union
FCM	food contact material
GHG	greenhouse gas
GPP	green public procurement
ICT	information and communication technology
LCC	life cycle cost(ing)
PET	polyethylene terephthalate
POPs	persistent organic pollutants
PC	polycarbonate
PVC	polyvinyl chloride
SVHC	substance of very high concern

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1. Introduction

This report provides a conceptual framework for a non-toxic, climate-neutral and circular procurement, i.e., the ChemClimCircle approach to procurement. For this purpose, the report first examines the integration of policies relevant to chemicals, circular economy and climate. The major interlinks and synergy between policy objectives and implementation that foster the integrated approach and causes of conflicts that hinder the integrated policy approach are assessed in [Chapter 2](#).

[Chapter 3](#) takes a closer look at current procurement processes in 8 countries: Sweden, Estonia, Latvia, Lithuania, Finland, Denmark, Germany, and Poland. The first part of the chapter studies the state of the art of green public procurement (GPP) at the national level. The second part describes the main characteristics of current municipal-level GPP approaches, including the use of sustainability criteria (for climate, circularity, chemicals and others) in the relevant product groups. The chapter concludes with a summary of the major barriers to the integrated ChemClimCircle approach in procurement as perceived by the project partners. [Chapter 4](#) is a summary of the previous analysis.

The conceptual framework in this report provides the basis for designing the ChemClimCircle concept as well as creating a guidance document and training programme for procurement stakeholders.

2. Interlinks, Synergies and Conflicts of Objectives of Green Public Procurement with regard to Chemicals, Climate and Circularity

2.1 Context and definitions

The European Green Deal¹ presents a roadmap for making the European Union (EU) economy sustainable by turning climate and environmental challenges into opportunities across all policy areas and making the transition just and inclusive for all. The European Green Deal aims to boost the efficient use of resources by moving to a clean, circular economy and to stop climate change, revert biodiversity loss and reach zero pollution for a non-toxic environment. It embraces various policy areas. As such, the Green Deal also provides a policy framework for the ChemClimCircle approach (see also [chapter 2.2](#)).

Climate impact is considered to be a main environmental problem as well as a priority policy area for the European Union. With the Green Deal policy initiatives, the EU aims to be climate-neutral by 2050 – an economy with net-zero greenhouse gas (GHG) emissions.

At the same time, the EU has acknowledged that if its economy remains so highly dependent on natural resources, the degradation and depletion of these natural resources will continue, as will waste generation. Therefore, one of the main objectives of the EU Green Deal and a new Circular Economy Action Plan² is to transition the EU's economy to be more productive while using fewer resources, including by moving towards a circular economy. The circular economy that uses waste as a resource contributes to the EU's economy becoming more competitive and carbon-neutral, thereby also reducing pressure on biodiversity.

The EU's Green Deal and Chemical Strategy for Sustainability acknowledge the necessity of using chemicals across the entire economy, including producing high-tech materials for a circular and climate-neutral economy. However, many chemicals have hazardous properties which can harm the environment and human health. Therefore, in a low-carbon and circular economy, it is essential that the harmful impact of chemicals is also reduced, and the goal to reach zero pollution for a non-toxic environment is defined for achievement by 2050.

Climate change, circular economy and chemicals (non-toxic environment) can be, in short, defined as follows:

¹ The European Green Deal, COM(2019) 640 final.

² A new Circular Economy Action Plan. European Commission, COM(2020) 98 final.

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Climate change means a change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and is in addition to natural climate variability observed over comparable time periods.³

A **circular economy** aims to transform the current linear economy into a circular model to reduce the consumption of finite material resources by recovering materials from waste streams for recycling or reuse, using products longer, and exploiting the potential of the sharing and services economy.

The **non-toxic environment goal** is characterised by the absence of hazardous substances in the environment and in man-made products. It is understood as a vision to guide decision-making towards phasing out hazardous substances from products and materials.

2.2 Integration of policies – interlinks, synergies and conflicts

The broad scope and complexity of sustainability aspects (e.g., climate, circularity and chemicals) constitute a challenge for policy. The identification of effective implementation strategies would need to be supported by integrated policies that take into account the multiple interlinkages and synergy between the different dimensions of sustainability.

2.2.1 Integrated approach

The importance of promoting an integrated approach in policy implementation is not new. Policies improving a specific area can generate impacts in other areas, with a large set of possible positive or negative effects (synergies and conflicts – see also [chapter 2.2.2](#)). A whole set of mechanisms and practices have been built up in support of this approach in EU policy implementation to encourage the search for such interlinks and synergy as well as inform the trade-offs that are often inevitably required.

The European Green Deal provides a good example of such an approach. The examples of EU thematic policies and strategies relevant to the ChemClimCircle (toxic-free environment, climate and circularity) approach are the following:

- **EU Circular Economy Action Plan** – announces initiatives along the entire life cycle of products. It targets how products are designed, promotes circular economy processes, encourages sustainable consumption, and aims to ensure that waste is prevented and that the resources used are kept in the EU economy for as long as possible while ensuring substances of concern do not pose risks in reused or recycled products. A series of measures and actions are developed in the frame of this action plan. The specific focus is on the sectors that use the most resources and where the potential for circularity is high, such as electronics and ICT, batteries and vehicles, packaging, plastics, textiles, construction and buildings, food, water and nutrients.

³ United Nations Framework Convention on Climate Change (UNFCCC), Article 1.

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- **European Climate Law** – establishes the aim of reaching net zero greenhouse gas emissions (GHG) in the EU by 2050. The law sets an intermediate target of reducing GHG by at least 55% by 2030 compared to 1990 levels. The 'Fit for 55' package is a set of policy proposals by the European Commission to achieve this 55% reduction target, including changes to existing policies, as well as new measures to reduce emissions.
- **EU Chemicals Strategy for Sustainability Towards a Toxic-Free Environment** – aims at better protecting citizens and the environment from harmful chemicals and boosting innovation by promoting the use of safer and more sustainable chemicals. The strategy consists of several actions, including revising several pieces of EU chemicals legislation and action plans on persistent chemicals and endocrine disruptors. In addition, the strategy foresees increased enforcement and the development of a framework for identifying safe and sustainable-by-design chemicals. The strategy addresses the need to ensure that hazardous chemicals do not prevent the functioning of the circular economy. It should also contribute to the EU's zero pollution ambition.
- **EU Zero Pollution Action Plan** – aims to strengthen the EU's leadership in transitioning to a green, digital and circular economy while creating a pathway towards a healthy planet for all. The action plan provides a compass to mainstream pollution prevention in all relevant EU policies, step up implementation of the relevant EU legislation, and identify possible gaps.

Although the aim is to integrate the policies and objectives, this is not always the practice.

2.2.2 Synergies and conflicts

The objective of climate policies is to reduce the emission of greenhouse gases (GHGs) that contribute to climate change. The circular economy policies aim to reduce the use of (primary) resources by enhancing reuse and recycling as well as implementing new business models like sharing economies. The objective of chemical policies is to protect human health and the environment from exposure to toxic substances by prohibiting the use of hazardous substances and better controlling the use of chemicals with harmful properties. The objectives of the three policy areas, chemicals, climate and circularity, may create synergy or conflict with each other.

2.2.2.1 *Climate aspects in the circular economy*

To reach net-zero GHG emissions, we also need to change the way we produce and consume products/goods and materials. Today, when tackling the climate crisis, we tend to focus mainly on the transition to renewable energy, complemented by energy efficiency measures. These measures can only address 55% of GHG emissions. The remaining 45% of the emissions come from producing the goods and products (such as cars, clothes, food, and other products) we use every day.⁴ The aim to increase the re-use of products, i.e. waste prevention by increased reparability and the prolongation of the lifetime of products (including via the use of chemicals), is an important cornerstone at the interface of circular economy and climate change. In addition, the circular economy can prevent GHG emissions because the production of secondary materials (in most cases) requires much less energy and resources than the production of primary materials. Therefore, increased recycling targets and targets to use recycled materials in products are important boosters to turning the EU into a climate-neutral economy.

⁴ Completing the picture. How the circular economy tackles climate change. Ellen MacArthur Foundation, 2019.

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However, there may be turning points where the recycling of materials may consume more resources and energy than the production of primary materials: very high recycling targets could contribute to increased energy use/carbon footprint. This could be the case for very complex products, where the disintegration requires many specified steps or the separation of materials requires particular (energy-intensive) processes, such as in the separation of metals. For high-level recycling approaches, such as chemical recycling, little information is available on how resource-intensive the processes are and if there is a net saving in GHG emissions compared to the primary production. The benefits of recycling also depend on the number of life cycles a product or a material may have.

2.2.2.2 Chemical aspects in the circular economy

The circular economy should also contribute to a non-toxic environment, and vice versa; i.e., less toxic chemicals should enter the waste stage, and toxic chemicals in wastes should not be included in products for reuse or recycled into secondary materials. The reduction of the use of hazardous chemicals benefits the circular economy, as the absence of hazardous chemicals in products and material streams enables the reuse and recycling of more and cleaner products and materials, compared to those that have to be disposed of at present due to the content of hazardous substances, e.g. POPs, with lower (decontamination) efforts.

However, ambitions of a circular economy can create a potential policy conflict between the increased circulation of resources and the reduction of exposure to hazardous substances that exert negative effects on humans and the environment. Secondary raw materials (except production wastes) are much more heterogeneous than the resource base for the linear economy (virgin materials), and many hazardous chemicals may be contained in waste products, whether added intentionally or non-intentionally, which are unknown to the recyclers. Even substances that are nowadays strictly regulated and phased out from primary production can thus be inadvertently retained in the economy through circulation – for example, endocrine disruptors in the form of brominated flame retardants through e-waste recycling or recycling of PVC-plastic containing phthalates, which are toxic to reproduction. Furthermore, prohibited 'legacy substances' may remain in society for a long time through products with a long designed-in lifetime.⁵

From the resource perspective, chemicals legislation may hinder achieving reuse and recycling targets: if restrictions are passed after a product has been placed on the market or substances contained in products are included in the candidate list, the reuse of these products may be prevented. In the first case, the content of restricted substances makes their placing on the market illegal and in the second case, the obligation to inform consumers of the content of substances of very high concern (SVHCs) in products, according to REACH Article 33⁶ might prevent the reuse of these products as these substances are next in line for prohibition. Another aspect is that suppliers cannot fulfil the obligation of information because it is common that the

⁵ Towards clean material cycles: Is there a policy conflict between circular economy and non-toxic environment? Editorial, Waste Management & Research, 2020, Vol. 38(7) 705–707.

⁶ Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02006R1907-20221217>

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information on SVHCs is not transferred in the delivery chain; thus, the content of these substances might be unknown to the recycler.

2.2.2.3 Chemical aspects in the climate policy

The reduction of the use of hazardous chemicals benefits climate policies. Some widely used chemicals are resource and energy-intensive to produce and could be replaced by chemicals that require less energy to be produced. In general, chemicals based on renewable plant-based resources tend to create lower GHG emissions than those produced by fossil fuels, as they absorb carbon dioxide during their growth⁷. Another example is the production of chemicals from biomass, which can lead to significant GHG mitigation.⁸

In addition to the energy and CO₂ balance from the production of chemicals, there is a synergy between the reduction of chemical substance releases and climate policy due to the global warming potential of some chemicals. Many partial and perfluorinated hydrocarbons (especially HFCs, which are primarily used as refrigerants) have a climate impact corresponding to a multiple of CO₂. These compounds are, therefore, also called fluorinated greenhouse gases. For example, trifluoromethane, used as an extinguishing agent and refrigerant, has a global warming potential of 12 400 CO₂ equivalents⁹. This means that the climate impact of one kilogram of trifluoromethane is as strong as that of 12 400 kilograms of carbon dioxide. The existing EU regulation on fluorinated greenhouse gases (Regulation (EU) No 517/2014) reduced the supply of HFCs in the EU market by 37% between 2015 and 2019. The targeted 80% global reduction of HFCs by 2047 compared to 2013 would prevent global warming up to 0,4 °C.¹⁰

Conflicts in chemicals and climate policy goals may arise where the substitution of chemicals would result in increased use of energy (i.e., generation of GHG emissions). This could be the case, for example, where solvents are replaced with water, resulting in the need for increased heat use to evaporate water. Another conflict may arise where toxic chemicals are needed to develop technologies that would save energy or generate energy (i.e., a specific type of solar panel film containing cadmium).

⁷ For example, the EIONET report on greenhouse gas emissions of plastics states that 30% of GHG emissions could be saved if fossil-based polymers were replaced. Vanderreydt et al. 2021. Eionet Report – ETC/WMGE 2021/3. Greenhouse gas emissions and natural capital implications of plastics (including biobased plastics).

⁸ Huang, K. et al. Greenhouse Gas Emission Mitigation Potential of Chemicals Produced from Biomass. ACS Sustainable Chem. Eng. 2021, 9, 43, 14480–14487.

⁹ Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 1535 pp.

¹⁰ Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on fluorinated greenhouse gases, amending Directive (EU) 2019/1937 and repealing Regulation (EU) No 517/2014 <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52022PC0150>

2.3 Green public procurement – synergies and conflicts

Green Public Procurement (GPP) is getting more and more attention as an instrument that public buyers can use to systematically choose goods and services with a lower environmental impact, thereby contributing to sustainability, health and environmental objectives at the international, national, and local levels. GPP is a policy tool that has a key role in achieving EU environmental and health policy goals. Accordingly, GPP has to take the integrated approach for policy implementation into account as well. If public procurers are aware of the linkages and synergies between climate, circularity and chemical issues, conflicts between these three objectives can be avoided, and informed preference can be given to one or two of the goals if no win-win-win situation exists.

However, existing GPP schemes and criteria lack approaches to integrating the different dimensions, particularly climate impact, circularity and chemical risks. Most often, the procurement priorities have focused on single issues and goals such as climate neutrality or circular aspects. The matter related to avoiding hazardous substances in goods and services receives much less attention in procurement.

The health and environmental risks of chemicals can cause conflicts in procurement objectives (e.g., circularity versus contaminated materials, reuse versus products that contain hazardous substances). Also, the integrated nature and linkages between climate, circularity and chemicals/non-toxic environment are often not recognised in the selection of procurement criteria. The examples of the most common conflicts that hinder using the synergy and interlinks between different policy areas and objectives in public procurement are presented in Table 1.

Table 1. Causes for conflicts between climate, circularity and chemical issues in green public procurement

Causes of conflicts	Examples
European and national environmental strategies and policies have historically lacked an integrated approach – with policy 'silos' and isolated objectives.	Strategies (e.g., procurement strategies) usually address a single policy area, e.g., climate impact. The different environmental strategies lack coherence and references to the objectives of other strategies, and the connection between strategies and all sustainability aspects is weak.
Non-integrated policy implementation – climate vs. circularity vs. chemicals – legislation, guidance, and implementation tools insufficiently relate to other policies.	Circular economy objectives and approaches (including practical implementation in procurement processes) often promote only reuse and recycling, not taking into account health and environmental impacts related to hazardous substances.
Due to a lack of knowledge and coordination, the focus is on well-known priority impact areas – climate or circularity. Chemical aspects are often not recognised.	Very few municipal-level strategies (e.g., procurement strategies) point out the risks of hazardous chemicals. The knowledge is often scattered in different units of authority.
Controversial legal requirements.	Safety requirements sometimes demand the use of materials and products containing hazardous chemicals that might not even be of benefit and instead restrict the use of healthy alternatives. One example is chemical flame retardants, which have proven not to reduce the deaths from fire in homes in California, where it has been law to include flame

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	retardant substances in items such as upholstery. It is now banned instead as of 2020. ^{11, 12}
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Annex 1, below, provides more specific examples of conflicts and synergies related to procurement.

¹¹ <https://www.jdsupra.com/legalnews/california-joins-states-banning-flame-51212/>

¹² <https://www.theguardian.com/sustainable-business/2014/sep/30/healthcare-flame-retardants-gb117-california-steelcase-knoll-herman-miller-kaiser>

3. Mapping of National and Municipality-level GPP Implementation

This chapter maps the current approaches to green public procurement (GPP) and the integration of climate, circularity and toxic-free environment objectives into the procurement in eight countries and eleven municipalities of the Baltic Sea Region (Figure 1). The first sub-chapter studies the state of the art of GPP at the national level, and the second sub-chapter at the municipal level, based on the information provided by the project partners and associated organisations. Both sub-chapters conclude with comparative summaries of the national and local level approaches.

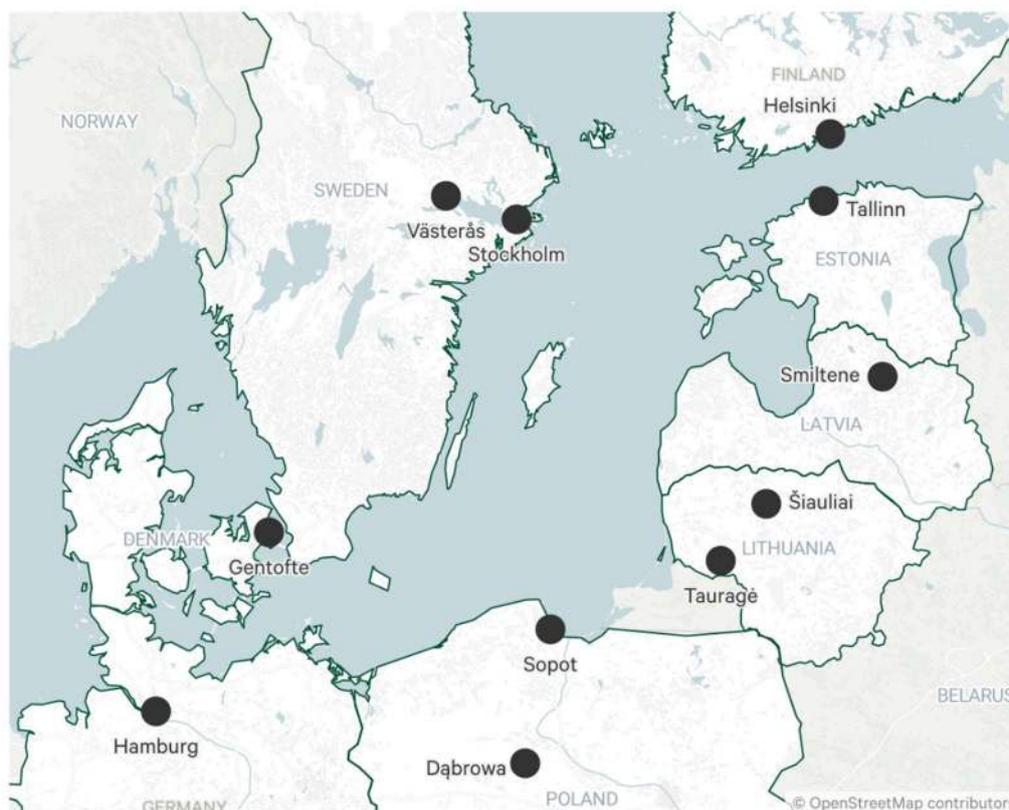


Figure 1. Analysed countries and municipalities

3.1 National-level approaches to GPP implementation (state-of-the-art)

The following sub-chapters provide information on GPP and ChemClimCircle approaches in Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland and Sweden. This information

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includes the strategic and legal framework, objectives and targets, GPP uptake and monitoring system. The final sub-chapter summarises the key findings as a comparison of national-level approaches.

3.1.1 Denmark

The Danish Government launched a Strategy for Green Public Procurement in 2020.¹³ It sets the direction for a green transition of public procurement, focusing on procurement areas with a large climate footprint at the national level. The overall target for GPP uptake is to reduce Denmark's greenhouse gas emissions by 70% in 2030 compared to the level in 1990 and for climate neutrality by 2050.

The specific targets include:

- To the extent possible in 2023 and by 2025 at the latest, the government's procurement of a number of agricultural products must be deforestation-free.
- By 2030, the public vehicle fleet must be emission-free.
- By 2030, all public procurement must be eco-labelled.

The Agency for Public Finance and Management coordinates the implementation group for the national GPP strategy, which gathers key stakeholders around the table. The Environmental Protection Agency is a key actor fostering GPP through guidance, tools and managing the GPP forum and partnership.

The Public Procurement Act provides a fairly broad framework for prioritising green considerations in procurement.

The government is making it mandatory to choose an eco-labelled product or a product that meets similar requirements when procuring for the government if there is adequate competition and no significant price difference. Initially, the requirement will apply to cleaning agents, paper, printed matter, soap and hygiene products. The list of product groups with requirements for eco-labelled procurement will generally be updated once a year and expanded in this way on an ongoing basis. The government will initially introduce a requirement that, from now on, government institutions must only procure LED light sources from the two top energy classes in energy labelling. The government is making it mandatory to use the total cost of ownership as an economic price parameter in connection with government procurement where possible and appropriate. This way, the focus will shift from the upfront price to costs throughout a product's life cycle.

There is a clear political will to monitor carbon emissions related to public procurement. The Danish Agency for Public Finance and Management calculates the climate footprint as part of the green procurement strategy (annual reports, first published in 2020). It is the starting point for Denmark to become one of the first countries in the world to set a specific reduction target for public procurement.

¹³ Ministry of Finance (2020). Green Procurement for a Green Future – strategy for green public procurement. <https://oes.dk/indkoeb/strategy-for-green-public-procurement/>

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The Ministry of the Environment has three main initiatives to promote green purchasing in Denmark¹⁴:

- The Forum on Sustainable Procurement – a national network that is a knowledge-sharing forum where procurers from public and private organisations can keep updated on best practices, methods and tools for GPP through a website, newsletters and various events.
- The Responsible Procurer – a webpage where procurers can find green criteria ready to copy and paste into tender documents for a number of product areas and the total cost of ownership tools for selected product areas.
- The Partnership for Green Public Procurement (POGI) is a collaboration between municipalities, regions and public organisations who are committed to making efforts to reduce their environmental impact from their procurement actions and drive the market towards less environmentally damaging products and solutions. Members need to have a publicly available procurement policy stating their GPP ambitions. They must also follow the procurement criteria, which are jointly developed and updated annually.¹⁵ The environmental criteria cover the following product groups: foodstuffs, transportation, construction, wood, cleaning, children's products, ICT equipment, lighting, wood-based office supplies and printed materials, household and commercial kitchen equipment, and textiles.

In 2020, the Competition and Consumer Authority assessed that about 44% of all tenders in Denmark contained a green element (Status for public competition, 2020. The Competition and Consumer Authority). Information on GPP product groups is not available.¹⁶

3.1.2 Estonia

Estonia is one of the few EU member states that does not have a national strategy or action plan for GPP, which has driven inconsistent GPP implementation in Estonia's national and local authorities.

Since establishing the national-level mandatory GPP criteria in four product groups by the Minister of the Environment's regulation in 2022, the GPP implementation mainly focuses on these four groups: furniture, cleaning products and services, computers and monitors, copying and graphic paper. The environmental requirements for these categories are based on the EU GPP criteria and adapted to the Estonian context.

In 2023, the regulation on the environmental criteria for clean vehicles was adopted. The criteria in two more categories are under development: road lighting and traffic signals, imaging equipment, consumables and print services.

The Public Procurement Act provides the legal basis for considering environmental criteria in public procurement. The Ministry of the Environment is responsible for developing and implementing the GPP policy: this includes maintaining a GPP portal with guidance material and a contact form for user support, organising training and capacity-building events. There is no separate central GPP support organisation for municipalities. The Ministry of Finance is

¹⁴ <https://eng.mst.dk/sustainability/sustainable-consumption-and-production/sustainable-procurement/>

¹⁵ <https://denansvarligeindkober.dk/pogis-indkoepsmaal>

¹⁶ Denmark – Procurement Monitoring Report 2021, https://single-market-economy.ec.europa.eu/single-market/public-procurement/country-reports-and-information-eu-countries_en

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responsible for public procurement policy, drafting the law, and providing supervision and consulting. As a GPP support tool, a recently developed CO₂ calculator can be used to estimate the life cycle CO₂ emissions of construction works.

One of the strategic documents of the Estonian environmental policy – the programme for environmental protection and use, sets a non-binding target of 35% for GPP of the total cost of all public procurement by 2026. In 2022, GPP accounted for 17% of the total cost of public procurement. In the electronic public procurement register, 6,9% of the total number of public procurements was marked as GPP in 2022.

However, the register doesn't clearly define GPP, and since procurers do not have sufficient knowledge of GPP, the register doesn't reflect the real situation concerning GPP implementation in Estonia. Official statistics count public procurement as GPP if the procurer has responded “Yes” to the question in the register whether the public procurement includes environmentally friendly aspects. At the same time, the procurer may have answered no, but the procurement still contains environmental criteria – to count these procurements as GPP, it is necessary to look through the particular procurement criteria.

While GPP is periodically monitored through the public procurement register, its impact has not been assessed.

3.1.3 Finland

The National Procurement Strategy of Finland, published in 2020,¹⁷ provides directions for GPP. The basis of the strategy is strategic leadership, procurement know-how and decision-making based on data and efficiency. The targets are implementing high-quality procurement, supporting dynamic markets, and enabling innovation via public procurement. When these components are implemented, we can have ecological, social, and financial benefits.

The national strategy's ecological component includes a statement that Finland is a forerunner in GPP. This is done via the following:

- Public procurement supports Finland's climate commitments to be carbon neutral in 2035 and a circular economy,
- Public procurement supports biodiversity,
- We promote a sustainable food supply and procure food that is produced sustainably and responsibly.

In addition to the Ministry of Finance, advancing and follow-up of the national procurement strategy are implemented by the Association of Finnish Municipalities, the Ministry of Economic Affairs and Employment, the public entities of Finland and Hansel – the national joint procurement unit¹⁸.

¹⁷ <https://julkaisut.valtioneuvosto.fi/handle/10024/162418>

¹⁸ Hansel is a non-profit limited company acting as a central purchasing body for central and local governments in Finland. Hansel is owned by the Finnish Ministry of Finance and the Association of Finnish Local and Regional Authorities. They want to act as a pioneer in promoting GPP. Hansel's Ecolabel is given to all joint public procurements which have considered environmental aspects.

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Motiva¹⁹ and Competence Centre for Sustainable and Innovative Public Procurement (KEINO)²⁰ are responsible for advancing GPP on a national level.

There are no specific requirements for GPP or mandatory criteria for product groups in Finland. The procuring entities (incl. municipalities) enjoy great latitude in how they formulate their calls to tender, which can include environmental criteria. The Finnish municipalities have ambitious environmental targets, and many municipalities have made internal guidelines about specific tenders. However, municipal procuring entities are also recommended to follow the Government's Decisions-in-Principles (which are binding goals for government procurements) for sustainable procurements, and they include, e.g., cleantech and food procurements as product groups. In addition, the food procurements are mentioned specifically in the National Procurement Strategy, as seen above in the GPP goals.

National Procurement Strategy is monitored by Hilma – the official service for notices on public procurement, and from 2022, the environmental objectives can be monitored²¹. The Finnish Environment Institute SYKE (2017²²) and the Ministry of Finance (2020²³) have also conducted studies on the state of public procurement in Finland. Based on research in 2017 by SYKE, 2/3 of tenders in Finland include general environmental requirements, and about 40% of tenders include more specific environmental requirements. The annual value of public procurement has been estimated to be 47 billion euros. SYKE also develops calculations of the carbon footprint of public procurement. Procurers can evaluate their carbon footprint based on SYKE's calculations from procurement data service operated by Hansel²⁴.

The support activities for public procurers are coordinated by KEINO – a network-based competence centre for sustainable and innovative public procurement in Finland²⁵. Several organisations provide their expertise in the centre. KEINO is part of the Government Programme's implementation. It is funded and steered by the Ministry of Economic Affairs and Employment.

3.1.4 Germany

At the federal level of Germany, the Sustainability Action Plan (*Maßnahmenprogramm Nachhaltigkeit 2021*) sets forth GPP ambitions for public administration. Climate-friendly procurement is a prominent theme on the federal level because all central authorities need to become climate-neutral by 2030 under the Federal Climate Change Act. To achieve this goal, the general administrative regulation on climate (*AVV-Klima*) came into force on 1 January 2022, stipulating that only low-carbon goods and services may be procured. The regulation orders federal procurement agencies to use life cycle costing, including the cost of carbon emissions

¹⁹ Motiva is a government-owned company which offers specialist services to accelerate sustainable development. They provide advice and guidelines to encourage organisations to make green procurements, to meet their goals in sustainability and responsibility. Motiva wants to regularise green and innovative procurement as an operating model/standard of activity.

²⁰ <https://www.hankintakeino.fi/en>

²¹ <https://www.hankintailmoitukset.fi/en/>

²² <https://helda.helsinki.fi/handle/10138/228340>

²³ <https://julkaisut.valtioneuvosto.fi/handle/10024/162171>

²⁴ <https://www.hansel.fi/hankintapulssi/>

²⁵ <https://www.hankintakeino.fi/en>

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(CO₂ price), in procurement. It also encourages using the German Blue Angel ecolabel and environmental management systems as prequalification criteria.

Another key regulation that fosters GPP in Germany is the Circular Economy Act. It mandates that procuring entities on the federal level need to prefer goods and works manufactured or performed using processes that save raw materials, energy, and water; generate few pollutants and waste; are suitable for or involve reuse, recycling and repair.

The German procurement system is highly decentralised, and the procurement rules may differ at federal, state and municipality levels. However, applying GPP criteria for procuring energy-consuming products and services, as well as road vehicles is mandatory.

Most German states have guidelines and make existing guidance available on websites or incorporate it into existing regulations. Ecolabels are widely used in German procurement, both on the federal and local levels. The Competence Centre for Innovative Procurement (KOINNO, carried out by the German Association for Materials Management, Purchasing and Logistics (BME) on behalf of the Federal Ministry of Economics and Climate Protection) provides a toolbox that includes GPP and life cycle cost instruments and guidelines.²⁶ Information for procuring entities is also available at:

- Federal Environment Agency with extensive materials such as training materials, expert reports and guidance for product groups²⁷
- Sustainable Procurement Competence Centre²⁸ (based at the Federal Ministry of the Interior)
- Sustainability Compass website for making procurement processes sustainable in all phases²⁹

The German Federal Statistics Office started to collect information from all contracting authorities on the sustainability criteria used in award procedures in 2022. According to their report, 12,5% of the procurement contracts awarded during the first half of 2021 included sustainability criteria (environmental, innovation and social considerations), which amounted to 31,5% of the total economic value of contracts awarded.³⁰

3.1.5 Latvia

Latvia does not have a national strategy or action plan for GPP. In 2017, Latvia established GPP as mandatory for certain product groups with the regulation "Requirements for green public procurement and the procedure for their application". There are seven mandatory GPP product and service groups in Appendix 1 of the regulation: 1) office paper, 2) printing equipment, 3) computer equipment and information and communication technology infrastructure, 4) food and

²⁶ <https://www.koinno-bmwk.de/oeffentliche-auftraggeber/toolbox>

²⁷ <https://www.umweltbundesamt.de/themen/wirtschaft-konsum/umweltfreundliche-beschaffung>

²⁸ http://www.nachhaltige-beschaffung.info/DE/Home/home_node.html

²⁹ <https://kompass-nachhaltigkeit.de/>

³⁰ Bundesministerium für Wirtschaft und Klimaschutz 2022. Vergabestatistik: Bericht für das erste Halbjahr 2021. https://www.bmwk.de/Redaktion/DE/Publikationen/Wirtschaft/bmwk-vergabestatistik-2021.pdf?__blob=publicationFile&v=14

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catering services, 5) cleaning products and services, 6) indoor lighting, 7) street lighting and traffic signals.³¹

Appendix 2 of the regulation defines the criteria for products under voluntary GPP. Voluntary criteria are set for the design, construction and maintenance of office buildings; road construction and traffic signs; water boilers for heat production; gardening products and services; electric energy; WC closets and pissoirs; cogeneration equipment; furniture; wastewater infrastructure; wall panels; sink faucets, shower faucets and similar equipment; textile products; transport; electrical and electronic equipment in the health sector; infrastructure for sports and recreation.

Out of the 15 groups of products and services for which voluntary GPP criteria apply, construction works and transport are the most significant in terms of financial proportion.

In 2020, the share of GPP in all public procurement was 29,1% in financial terms. In absolute values (without VAT), the volume of GPP was 850 million euros from the total of 2,93 million euros of public procurement subject to the regulation of the Public Procurement Law.³²

The Ministry of Environmental Protection and Regional Development (VARAM) is responsible for promoting GPP and GPP policy development. The Procurement Monitoring Bureau, a subordinate institution of the Ministry of Finance, implements public administration functions in the supervision of procurement procedures. The Procurement Monitoring Bureau also publishes public procurement notices on its website and updates the most important procurement data every quarter of the year. The most recent studies about GPP (applying the requirements of environmental criteria) are available for food and catering services³³ (2018) and construction³⁴ (2017).

To support the GPP implementation, VARAM, together with the Environmental Investment Fund, has provided training and seminars for procurement specialists on GPP. The VARAM website includes a support page for GPP³⁵, where a guidance handbook is available along with other informative materials and links, including:

- Life cycle cost calculator
- Life cycle cost calculator for construction
- Guidelines for GPP

There are also some data analyses on VARAM's website about the organic agriculture market and GPP criteria of vehicles, construction works and textiles.³⁶

³¹ <https://likumi.lv/ta/id/291867-prasibas-zalajam-publiskajam-iepirkumam-un-to-piemerosanas-kartiba>

³² <https://lvportals.lv/dienaskartiba/326627-2020-gada-butiski-palielinajies-zpi-apjoms-valsts-un-pasvaldibu-iepirkumos-2021>

³³ <https://data.gov.lv/dati/lv/dataset/partikas-produktu-piegades-ligumi-piemerojot-vides-kriteriju-prasibas>

³⁴ <https://data.gov.lv/dati/lv/dataset/publikaciju-statistika-par-vides-aizsardzibas-prasibam/resource/555e9ab5-e0b3-49b7-95d5-430661a7f8f2>

³⁵ <https://www.varam.gov.lv/lv/normativais-regulejums-un-metodiskais-atbalsts>

³⁶ <https://www.varam.gov.lv/lv/informativie-un-audiovizualie-materiali>

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3.1.6 Lithuania

Lithuania has set the vision for GPP as one of the key instruments in greening the public sector and shifting the market towards a green economy in the Programme of the Government, approved by the Government Resolution in 2020. The government resolution on Green Public Procurement Goals and Implementation, signed in 2021, established national targets for GPP by the value of all public procurement: >10% in 2021, >50% in 2022, and 100% in 2023 and onwards. This target means that all contracting authorities must apply the green purchasing rules and criteria when purchasing goods, works or services.

The rules and criteria for green purchasing are detailed in the order of the Minister of Environment, which defines core and advanced criteria for 32 product groups. Priority product groups are not distinguished. Contracting authorities can also demand type I ecolabels for products or environmental management systems for services or works. If no criteria are available for the product in question, contracting authorities can define other criteria according to specific environmental principles set out in the order. In 2023, the minimum environmental criteria were updated for 18 product groups and obligatory criteria were added for secondary packaging.

As of 2022, 60,9% of the total cost and 34,2% of the total number of public procurement was green public procurement in Lithuania.³⁷ Among this share are procurements, which include environmental criteria set at the national level, type I ecolabels, environmental management systems or criteria defined by the contracting authority.

The Green Public Procurement Plan 2021–2025 delegates the tasks and defines the timeline for various strategic objectives until 2025. The responsibility for developing GPP criteria and legal orders lies with the Ministry of the Environment. The Public Procurement Office of Lithuania has a separate department of Sustainable Public Procurement, which consults purchasing organisations on GPP, creates training, organises events and builds capacity in other ways. Both the Public Procurement Office and the Ministry of Environment share information about GPP on the web.³⁸ Currently, there are no tools available created by Lithuanian institutions, but a life cycle cost tool is under development.

All public procurements in Lithuania are electronic, and a procurement report must follow all public procurements, clarifying whether it includes GPP criteria or not. The Public Procurement Office publishes the numbers of GPP in Lithuania overall and by different institutions. However, the impact of GPP is not evaluated in Lithuania.

3.1.7 Poland

At the national level, the State Purchasing Policy forms a new cornerstone of GPP activities in Poland.³⁹ The Council of Ministers adopted the policy in January 2022, and it serves as a medium-

³⁷ <https://vpt.lrv.lt/lt/statistika-ir-analize/pirkimu-vykdytoju-zemelapis-svieslente-1>

³⁸ <https://vpt.lrv.lt/lt/darnieji-pirkimai/zalieji-pirkimai-1>
<https://am.lrv.lt/lt/veiklos-sritys-1/kitos-veiklos-sritys/zalieji-pirkimai>

³⁹ https://www.uzp.gov.pl/data/assets/pdf_file/0012/55110/State_Purchasing_Policy_ENG.pdf

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term procurement strategy covering the years 2022 to 2025. By 2025, the aim is to increase the uptake of GPP by 7% from the base value of 1,1% (the share of awarded contracts) in 2020.⁴⁰

Based on the data provided by the contracting authorities to the Public Procurement Office, 1544 green public contracts were awarded in 2020. Compared to the year before (2019), their number increased by 17%, and compared to 2016, they increased by 158%.

The total value of green public procurement (excluding value-added tax) in 2020 amounted to 1,3 billion € (12,3 billion PLN) and accounted for 6,7% of the total value of public contracts awarded. Its value doubled in comparison to the previous year (2019) and increased about ten times compared to 2016.

The purchasing policy is mandatory for the central administration and other public entities when they use government funds and programs. It foresees the development of a catalogue of products and services for which green procurement criteria would be mandatory. This catalogue will be updated every two years. The policy also defines desired voluntary activities and outcomes for purchasing sustainable and innovative products and services.

The only policies requiring minimum use of environmental criteria in procurements follow EU directives (2009/33/EC, 2012/27/EU), which address government vehicle purchasing and energy efficiency in buildings. Otherwise, using green criteria in procurements is voluntary.

The Ministry of Development and Technology is responsible for procurement policy and legislation. The Public Procurement Office (PPO) is assigned specific GPP responsibilities, such as organising training and disseminating information on relevant regulations and practical examples, including a guide to support contracting bodies in implementing GPP.

The PPO developed a monitoring system based on information provided by the contracting body in procurement contracts and gathered in an annual report. All inclusions of environmental and social features are included in a table, allowing the PPO to track awarded contracts that included environmental considerations. However, the PPO performs little follow-up on GPP.⁴¹

Despite these initiatives and regulations, the implementation of GPP in Poland is still in the early stages, and there is much room for improvement. The lack of awareness and knowledge of GPP among public procurement officials, as well as the lack of clear and consistent criteria for evaluating the environmental performance of products and services, are major challenges facing the implementation of GPP in Poland.

3.1.8 Sweden

The Swedish National Public Procurement Strategy, adopted in 2016, has seven strategic goals for public procurement. The goals cover efficiency, competition, good business, legal certainty, as well as promotion of innovation and social and environmental sustainability. The Procurement Strategy states the following as a primary goal:

⁴⁰ Ministerstwo Rozwoju i Technologii 2022. Polityka Zakupowa Państwa. Ministerstwo Rozwoju i Technologii. https://dap-static.infor.pl/dap/000/616/355/MPO_2022-0125_LINK.pdf

⁴¹ Kaaret, K., Piirsalu, E. and Machlowska, M. Decarbonizing the EU's road and construction sectors through green public procurement: the case of Estonia and Poland. Policy brief. Stockholm Environment Institute, Stockholm. <http://doi.org/10.51414/sei2022.031>

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Environmental considerations in public procurement imply both securing an as low as possible negative environmental effect in all tenders as well as using the purchasing process as a strategic tool to reach environmental goals.⁴²

The Public Procurement Act of 2016 encourages environmental considerations in public procurements. There is a statement in the Swedish implementation of the EU procurement directive that environmental criteria should be used in all procurements where applicable.

The procuring entities (incl. municipalities) enjoy great latitude in how they formulate their calls for tender, which can include environmental criteria. No mandatory criteria for product groups are established at the state level. Still, the National Agency for Public Procurement, under the Ministry of Finance, publishes sustainability criteria that set some sort of standard in the country to promote sustainable public procurement (and Agenda 2030 goals). The criteria are divided into the following product and article groups: IT and telecom; building and property; cleaning and chemicals; vehicles and transport; office and textiles; food; nursing and care; toxic-free preschool; labour law requirements. Most of the criteria are also available in English.⁴³

The Ministry of Finance is responsible for setting procurement policies (e.g., the national strategy). The National Agency for Public Procurement is tasked with supporting the implementation and follow-up of the national public procurement strategy through a variety of activities. The agency collects and conveys knowledge as well as develops tools, methods and guidance for GPP. The tools that support the implementation of the procurement strategy include:

- A criteria service, which features a database of criteria for the above-mentioned product categories, with three ambition levels: core, advanced and beyond state of the art ("spearhead");
- A risk analysis service detailing where in the supply chain different products pose higher social and environmental risks;
- A life cycle costing tool allows users to calculate the cost of the product or service over its whole life cycle. This tool does not directly include environmental considerations but enables users to grasp the cost of, e.g., the energy use over a product's entire life cycle.
- A daily open Q&A service by telephone, chat and through question web forum responding to over 7000 questions a year.

In 2022, the National Agency for Public Procurement launched a statistical service⁴⁴ where all their statistical products are made available. The annual value of public procurement in Sweden is close to 800 billion SEK (80 billion EUR). 18 540 individual procurement procedures were launched in 2018, and 18 421 in 2021 = the number did not change much over those years.

National-level statistics on the share of published tenders that include sustainability criteria are not available since the procuring organisations in the current system do not provide this

⁴² https://www.upphandlingsmyndigheten.se/styra-och-leda-inkopsverksamhet/nationella-upphandlingsstrategin/#sju_inriktningsmal

⁴³ <https://www.upphandlingsmyndigheten.se/en/criteria/>

⁴⁴ <https://www.upphandlingsmyndigheten.se/statistik/upphandlingsstatistik/statistik-om-annonserade-upphandlingar-i-sverige-2021/>

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information. According to the new report on national procurement from April 2023⁴⁵, around 60% of the municipalities stated that they use environmental criteria and 50% that they use climate criteria in their procurements in order to fulfil the national environmental quality goals. On the other hand, only 17% of the municipalities replied that they use criteria for a circular economy. Also, only 25% of the municipalities said that they perform follow-up on their sustainability criteria; this is not sufficient for the effective use of procurement as a strategic tool, according to the report. These results are based on a survey where 243 municipalities answered a set of 70 questions on different topics related to public procurement, including the use of environmental, climate and circularity criteria. Climate effects from the total public procurement in Sweden are around 23,5 million tonnes of CO₂ equivalents. There is probably potential for reduction of this.

3.1.9 Comparative analysis of the key findings

The following comparative analysis summarises the major differences and similarities of the national approaches to GPP and ChemClimCircle in the analysed countries.

Responsible ministries, strategies and approach to implementation

In most analysed countries, the ministry responsible for public procurement policy is also the central government authority for GPP. In the Baltic States, GPP is the task of another ministry – the Ministry of the Environment (Table 2). While Estonia and Latvia do not have a valid strategy or action plan for developing GPP, the rest of the analysed countries have adopted strategic documents for GPP, either as a separate document or as part of a broader strategy.

Denmark, Finland, Germany and Sweden have defined climate among the environmental policy objectives to the achievement of which GPP has to contribute. In the Finnish procurement strategy, the objective of a circular economy is also explicitly mentioned. A non-toxic environment is highlighted among Sweden's 16 environmental quality objectives, to which public procurement is to contribute according to the national procurement strategy.

There are two main approaches to GPP implementation in the Baltic Sea Region. In Estonia, Latvia, Lithuania and Poland, the GPP implementation mainly focuses on the mandatory product groups, i.e., a top-down approach by establishing national-level obligatory procurement criteria. Lithuania has set up the mandatory application of environmental criteria on the broadest scale – for 32 product groups.

Germany requires the application of GPP for energy-consuming products and services and road vehicles. In Finland, Sweden and Denmark, GPP implementation follows a more voluntary approach that leaves higher flexibility to local authorities and an advisory role to the state. The municipalities in the Nordic countries have ambitious environmental targets and internal guidelines for public procurement.

⁴⁵ Nationella upphandlingsrapporten 2023. Rapport 2023:I. Upphandlingsmyndigheten, <https://www.upphandlingsmyndigheten.se/globalassets/dokument/publikationer/nationella-upphandlingsrapporten-2023.pdf>

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Table 2. National-level governing bodies, strategic documents and approaches to GPP implementation

	Responsible ministry for GPP policy	Strategic plan for public procurement/GPP	Environmental objectives related to GPP	National-level mandatory GPP product groups
Denmark	Ministry of Finance	National strategy for green public procurement, 2020	Reducing the climate footprint of procurement towards full climate neutrality by 2050	According to the GPP strategy, the GPP requirement will apply to cleaning agents, paper, printed matter, soap and hygiene products.
Estonia	Ministry of the Environment	No strategic document adopted	Environmental objectives have not been set	Mandatory and voluntary criteria in 5 product groups (2023)
Finland	Ministry of Finance	National Procurement Strategy, 2020	Public procurement supports carbon neutrality by 2035, a circular economy, biodiversity, a sustainable food supply	No mandatory product groups
Germany	Federal Ministry of Economic Affairs and Climate Action	Federal Sustainability Action Plan, 2021 (<i>Maßnahmenprogramm Nachhaltigkeit – Weiterentwicklung 2021</i>)	Public procurement supports carbon neutrality by 2030	Mandatory: energy-consuming products and services, road vehicles
Latvia	Ministry of the Environment	No strategic document adopted	Environmental objectives have not been set	Mandatory criteria in 7 product groups, voluntary criteria in 15 product groups (2017)
Lithuania	Ministry of the Environment	Green Public Procurement Plan 2021–2025, Strategy and Implementation	Public procurement supports climate change mitigation, waste management, and environmental protection goals	Mandatory criteria in 18 product groups (2023)
Poland	Ministry of Development and Technology	State Purchasing Policy 2022–2025	Public procurement contributes to the achievement of sustainable development, incl. environmental and health objectives	Voluntary with the exception of 2 product groups, where environmental criteria are mandatory (2022)
Sweden	Ministry of Finance	National Public Procurement Strategy, 2016	Public procurement must contribute to achieving the national environmental quality goals	No mandatory product groups

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Targets, uptake and monitoring

Almost all countries have adopted some targets to support their GPP policies and increase the uptake of GPP (Table 3). However, the targets are defined variously: for overall procurement or for specific product groups, by value or by the number of contracts. Furthermore, the countries may count GPP differently. For instance, Lithuania has a very ambitious but non-binding goal for 2023 and onwards to have all public procurement green. These procurements have to include environmental criteria set at the national level, requirements for type I ecolabels, environmental management systems or criteria defined by the contracting authority.

More specifically, Denmark aims to achieve that all public procurement in areas with official labelling schemes must be eco-labelled or comply with corresponding requirements in 2030.

Thus, comparing the level of uptake of environmental criteria is complicated due to different measuring aims and methods in the Baltic Sea Region countries. Still, based on the available data, higher levels of GPP uptake can be noted in Denmark, Finland and Sweden compared to the other analysed countries.

For monitoring of GPP, most of the eastern Baltic Sea Region countries that have established mandatory GPP product groups keep track of the annual share of GPP via central public procurement registers. Other countries monitor GPP mainly via surveys and studies, or they have recently also started to collect statistical information about the environmental aspects of procurement. In 2022, Finland added the fulfilment of environmental objectives in monitoring its national procurement strategy. Germany published its first report on using sustainability procurement criteria in 2022.

The environmental impact of procurements has been assessed only in a few countries, such as climate footprint/carbon emissions in Denmark, Finland and Sweden.

In several countries, competence centres are available for enhancing GPP and coordinating support activities for public procurers, including local authorities. In Estonia and Latvia, this role lies mainly with the ministries of the environment.

Table 3. National GPP targets, uptake, monitoring and support

	National GPP targets	GPP uptake	Monitoring	Main support provider for municipalities on GPP
Denmark	<ul style="list-style-type: none"> -By 2025, the purchased agricultural products must be deforestation-free; -By 2030, the public vehicle fleet must be emission-free; -By 2030, all public procurement must be eco-labelled. 	44% of all tenders contained a green element (2020)	No general monitoring system for GPP	Partnership for Green Public Procurement (POGI)
Estonia	GPP of the total cost of public procurement: 30% by 2025, 35% by 2026	GPP – 17% of the total cost of public procurement (2022)	GPP monitoring via public procurement register	Ministry of the Environment

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Finland	<p>The number of procurements that promote the goal of carbon neutrality by 2035 is measured</p> <p>The number of procurements that promote the implementation of the Finnish road map to a circular economy is measured</p> <p>Greenhouse emission savings via procurements</p> <p>In 2030, organic will account for 25% of food service purchases</p>	2/3 of tenders had general GPP criteria, and ~40% of tenders had more specific GPP criteria (2017)	Monitoring of national procurement strategy, incl. its environmental objectives, via official service for notices on public procurement	Competence Centre for Sustainable and Innovative Public Procurement (KEINO)
Germany	Since 2022, all central authorities need to procure low-carbon goods and services	12,5% of contracts awarded (31,5% of the total value of contracts) contained sustainability criteria (2021)	Information on GPP gathered in reports, first published in 2022	Competence Centre for Innovative Procurement (KOINNO), Sustainable Procurement Competence Centre
Latvia	No targets set	GPP – 29,1% of the total cost of public procurement (2020)	GPP monitoring via public procurement register	Ministry of the Environment
Lithuania	GPP share of all public procurement value: >10% in 2021, >50% in 2022, and 100% in 2023 and onwards	GPP – 60,9% of total cost and 34,2% of total number of public procurement (2022)	GPP monitoring via public procurement register	Department of Sustainable Public Procurement in Public Procurement Office; Ministry of the Environment
Poland	To increase the uptake of GPP number from 1% to 7% by 2025	GPP – 1% of total public procurement number (2020)	Information on GPP gathered in annual reports	Public Procurement Office
Sweden	No specific target set, but the SE implementation of the EU procurement directive states that environmental criteria should be used in all procurements where applicable.	Not available	No general monitoring system for GPP. Information on GPP is gathered via surveys.	National Agency for Public Procurement

3.2 Municipality-level approaches to GPP and ChemClimCircle implementation

This chapter gives an overview of the state-of-the-art in the implementation of green public procurement (GPP) and ChemClimCircle (CCC) principles in the project partner municipalities: Smiltene (Latvia), Taurage (Lithuania) and Stockholm (Sweden). In addition, examples of

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approaches to GPP and CCC are provided from seven associated municipalities: Gentofte (Denmark), Helsinki (Finland), Hamburg (Germany), Šiauliai (Lithuania), Dąbrowa and Sopot (Poland), Tallinn (Estonia) and Västerås (Sweden). The final sub-chapter summarises the key findings as a comparison of approaches at the municipal level.

3.2.1 Municipality of Gentofte, Denmark

3.2.1.1 The strategic framework supporting green public procurement

Gentofte procurement policy “Procurement with a sustainable balance 2022–2026” sets sustainability requirements within a triple bottom line strategic framework: economic, social, and climate and environmental sustainability. The sustainability requirements cover the whole procurement value chain: production, reduction in material and resource consumption, transportation, waste, recycling, and repairing versus buying new products. The goals for climate and environmental sustainability are:

- Reduction of climate footprint from the purchases,
- Circular economy, including waste prevention and avoiding unnecessary purchases

The climate footprint of the purchases is calculated every year. The policy also foresees using flexible tender and contract forms to support new green solutions. Collaboration with other public actors is a means to influence the market and thereby achieve large-scale operational advantages and results that could not have been achieved alone.

3.2.1.2 Procurement organisational structure

In the Department of Tenders, Contracts & Climate Economics, there are three teams, one for each of the topics, including five procurement officers, three contracts’ controllers, one e-trade officer and one of each: Environmental economist, Climate economist, Data analyst, and Project coordinator. All 13 employees have roles within the purchasing processes in the municipality and are communicating horizontally, although there are no specific and planned functions in this communication yet. Gentofte purchases for approximately 270 million euros per year.

In order to achieve efficient and quality-assured purchases, Gentofte uses the 3-in-1-Model for collaborating with the representatives from both private suppliers and employees in the given industry (i.e. Private Business and Employers’ Organisations and Trade Unions) prior to the tender (Figure 2).

An open dialogue is carried out between the parties to hear the interests at stake, use the parties’ combined extensive knowledge, and align expectations for the tender and the subsequent task solution.

The 3-in-1-Model is primarily used on larger contracts and mainly within services with extensive operational tasks or construction. On the basis of the Terms of Reference, a concrete model for the collaboration is set up, including the tasks and time planning.

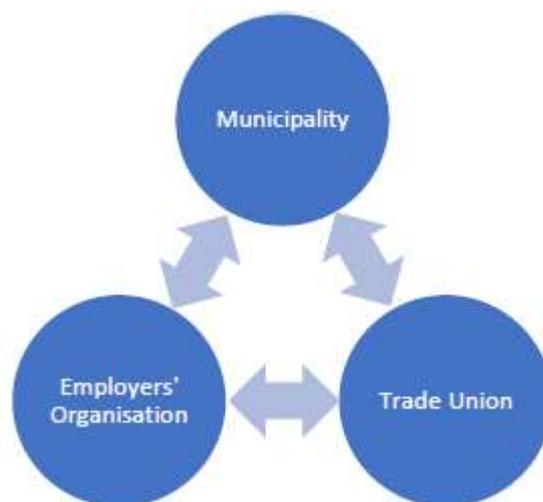


Figure 2. Partners in the 3-in-1-Model for tenders, Municipality of Gentofte

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3.2.2 City of Tallinn, Estonia

3.2.2.1 *The strategic framework supporting green public procurement*

The statute of the City of Tallinn highlights a general principle that the City council, the City government and the City's institutions prioritise environmentally sustainable solutions in procurement. Tallinn's development strategy for 2035 has established overall green goals. Still, the City of Tallinn does not have a local-level procurement strategy with a vision and targets for developing GPP in the city organisation. There are no specific GPP instructions and tools for the City procurers either. Therefore, in Tallinn, GPP focuses mainly on national-level mandatory GPP product groups and criteria (office paper, cleaning products and services, furniture, and office equipment).

3.2.2.2 *Procurement organisational structure*

Procurements are organised centrally by the Tallinn Strategic Management Office for the whole city organisation and individually by the city departments and city district administrations. Central procurements are conducted, e.g., for energy and fuels, IT equipment and services, travel agency services, office supplies, and tissue paper.

In addition to the central procurements to all city institutions, the Strategic Management Office carries out public procurements for the Tallinn City Office, city cultural institutions and city sports institutions. Moreover, the Strategic Management Office advises all institutions in Tallinn to carry out public procurement.

The procurement team of the Strategic Management Office consists of ten employees: a manager, lawyers and a project manager for green public procurement. The project manager for GPP advises and motivates the procurers to use green procurement criteria.

City departments and district administrations carry out public procurements in their specific fields. For instance, the Education Department organises public procurement for municipal schools (catering, renovation, furniture, construction of sports facilities, etc.). City district administrations procure local services (e.g., publishing the city district newspaper, maintenance of streets and green areas, construction and maintenance of playgrounds, dog walks and outdoor gyms, organisation of events, transport of tree leaves).

The total volume of public procurement in the City organisation, consisting of 265 institutions, was 550 million euros (2022). There is no clear threshold for procurements that are included in the public procurement register. Purchasing supplies, services and works below the simple procurement threshold, which is 30 000 euros, is mostly carried out as a purchase procedure in the city institutions and not through the register. Still, some city institutions or departments have established their procurement procedures so that purchasing supplies, services and works below the simple procurement threshold must be carried out through the register, too.

3.2.2.3 *Implementation of GPP*

Approximately 1/6 of all public procurements in the City of Tallinn is green public procurement. The majority of these green public procurements have used the criteria/requirement of an environmental management system. The qualification requirement for an environmental management system has mainly been stipulated in construction, road maintenance, waste management and other infrastructure service procurements. Environmental requirements based

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on the EU legislation are also used (such as emission standards for buses and other vehicles) in procurements, but often, procurers are not even aware that such criteria could be considered as GPP.

For example, in the period 1.11.2021–1.11.2022, the City departments and district administrations of Tallinn launched 118 public procurements in which at least one environmental criterion was used. Out of these 118 green public procurements, the majority (71%) required an environmental management system as a qualification criterion for selecting tenderers.⁴⁶

Although the biggest product and service groups procured by the City of Tallinn according to the total value of contracts awarded varies each year, they mainly include construction and infrastructure works, vehicles and catering services for municipal educational institutions.

Since the City of Tallinn has committed to implementing the Green Office environmental management system in all city institutions by the end of 2023, it will be a significant driver for GPP in purchasing office-related products and services.

3.2.3 City of Helsinki, Finland

3.2.3.1 *The strategic framework supporting green public procurement*

In accordance with the Environmental Policy of the City of Helsinki, environmental impact assessment must be carried out in all procurements exceeding the national threshold value. Therefore, the focus is on the promotion of responsible procurement, which is elaborated in particular by the City of Helsinki procurement strategy⁴⁷, approved by the City Board in December 2020.

In the Procurement Strategy, Helsinki emphasises the responsibility and effectiveness of procurement. Responsible procurement aims to reduce negative environmental impacts, promote positive impacts and take social responsibility better into account. The goals and measures related to the impact and responsibility help the City of Helsinki accomplish the goals set in its City Strategy⁴⁸ and in other related development programmes, such as the Carbon-Neutral Helsinki Programme⁴⁹ and the Action Plan for the Circular and Sharing Economy⁵⁰ for creating a more economically, environmentally and socially sustainable city.

In addition, the City of Helsinki has signed two Finnish green deal agreements, which both tackle sustainability issues through procurement. The first agreement aims towards zero-emission construction sites, and the second towards reducing hazardous substances in kindergartens and pre-school environments.⁵¹

3.2.3.2 *Procurement organisational structure*

The competitive tendering of procurements is decentralised to the divisions, offices of public officials, and subsidiaries owned by the City of Helsinki. The procurement units of the City of

⁴⁶ Tallinn Strategy Centre`s presentation (14.12.2022), https://ekja.ee/wp-content/uploads/2023/01/Tallinna-keskkonnahoidlikud-riigihanked_Kanarbik_141222.pdf

⁴⁷ <https://www.hel.fi/static/kanslia/Julkaisut/2020/Helsingin-kaupungin-hankintastrategia-en-2020.pdf>

⁴⁸ <https://www.hel.fi/static/kanslia/Julkaisut/2021/helsinki-city-strategy-2021-2025.pdf>

⁴⁹ https://helsinginilmastoteot.fi/wp-content/uploads/2019/06/HNH_päästövähennysohjelma.pdf (in Finnish)

⁵⁰ <https://julkaisut.hel.fi/en/reports/city-helsinki-action-plan-circular-and-sharing-economy>

⁵¹ More in: <https://kestavyys.hel.fi/en/responsible-procurement-and-circular-economy/>

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Helsinki have their own procurement teams that focus on the unit's services. The divisions, offices and enterprises are responsible for preparing their separate procurements and making the relevant decisions. Other organisations belonging to the Helsinki City Group prepare and decide on their own procurements. They can make use of the contracts of the joint procurement company Helsingin Konsernihankinta Oy (Helsinki Group Procurement Ltd). Preparations and decisions regarding joint procurements are made by the City Executive Office and the Social Services and Health Care Division. The City Executive Office is responsible for the joint coordination of procurements in cooperation with divisions and enterprises.

The City Executive Office tenders joint procurements such as cleaning chemicals, furniture, travel agency services, and foodstuff. City divisions carry out specific procurements related to their field. For example, the Urban Environment Division is responsible for the construction and maintenance of buildings and the urban environment.

The annual volume of Helsinki's procurements is about four billion euros, which makes Helsinki the largest operator engaging in public procurement in Finland. Procurements, i.e., internal and external purchases of and investments in services, materials, supplies and goods, constitute more than 50% of the City's expenditures.

3.2.3.3 Implementation of GPP

Environmental impact assessment must be carried out in all City of Helsinki's procurements exceeding the national threshold value. In addition, it is particularly important to set procurement criteria and contract terms and to implement contractual monitoring to minimise the environmental impact of the procurement object when making procurements in the following areas:

- Heating and electricity
- Construction and building materials
- Vehicles and transport services
- Food and food services
- Machinery and equipment
- ICT procurement
- Textiles
- Cleaning materials and services

In 2022, an average of 52% of the purchases included environmental criteria (viewed in terms of the number of procurements, not euros).

The City of Helsinki has internal guidance provided by Environmental Services and the City Office for implementing responsible and effective procurement in practice. The guidance includes, e.g., a process description that summarises the most important considerations about responsibility in the different stages of the procurement process as well as criteria bank.

The criteria bank (established in 2020) contains the most important responsibility aspects of different procurement groups, as well as examples of the successful use of the environmental and social responsibility criteria in procurement by the City of Helsinki and links to the mandatory criteria like the environmental criteria for vehicle purchases and transport service purchases.

In addition, the network for responsible procurement promotes and supports the cross-administrative implementation of responsible procurement in the city organisation. The network,

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consisting of responsibility and procurement experts, for instance, monitors the general state of the responsible procurement and shares information such as best practices.

Monitoring of the criteria is currently carried out in the City's common contract management system. Alongside, Helsinki follows the development of GPP monitoring at the national level, e.g., through Hilma⁵² and Hankintaluotsi⁵³. Monitoring and impact assessment are being further developed in order to obtain better information about the realisation of sustainability goals.

The biggest product and service groups, according to the total value of contracts awarded per year by the City of Helsinki, are various service purchases, construction and infrastructure works, building and public area maintenance and ICT procurement. The purchases and procurements of the City can be browsed in the open data services OpenProcurement.fi⁵⁴ and Helsinki Region Infoshare (HRI)⁵⁵.

Examples of an integrated approach in procurement:

In the Canemure project⁵⁶, the City of Helsinki has worked to make sustainability and low carbon key factors in procurement processes. During the project, the City has created nine successful examples (including building and infrastructure construction, work clothes and food procurements) and applicable tools that contribute to the development of sustainable procurement in Helsinki and in other cities in Finland. The case descriptions (pdf) can be found on the project website.

As an example, the aim of the work clothes procurement was to take the sustainability criteria to a whole new level and particularly emphasize social responsibility. In addition, the objective of the procurement was to acquire durable, functional and safe work clothing. The procurement criteria assessed, e.g., the transparency of supply chains, reduction of harmful chemicals, recycling and renewable energy.

Potential for an integrated approach in procurement

Helsinki sees that construction procurements have a huge potential for an integrated approach to take into account chemicals, climate and circular economy aspects and demand low-emission construction sites. The City of Helsinki has a strong role both as a client as well as a real estate developer and constructor in its own right, and thus, the city has steadily adopted new ways, especially to reduce the climate impact. For example, the city has recently set a carbon footprint limit for residential buildings in the new zoning requirements. To promote both circular economy innovations and business through, e.g., market engagement, a circular economy cluster programme⁵⁷ has been established whose actions further the city's climate goals as well.

In addition, to reduce the environmental and health risks, the City of Helsinki is working to reduce harmful chemicals in varying procurements concerning the kindergartens and pre-school

⁵² <https://www.hankintailmoitukset.fi/en>

⁵³ <https://www.hansel.fi/hankintaluotsi/>

⁵⁴ <https://tutkihankintoja.fi/?lang=en>

⁵⁵ https://hri.fi/data/en_GB/dataset/helsingin-kaupungin-ostot

⁵⁶ <https://helsinginilmastoteot.fi/en/venture/canemure/>

⁵⁷ <https://testbed.hel.fi/en/circular-economy/>

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environment. In the national green deal agreement (2020–2025)⁵⁸, Helsinki, together with other signed partners, has been implementing criteria in procurements of, e.g., cleaning services, detergents, and indoor toys. The goal of the green deal agreement is to reduce the total exposure of children to chemicals through public procurement, and the work is coordinated by Motiva. In the coming years, the construction procurements are going to take into consideration the synergies and results of the NonHazCity 3⁵⁹ project in which Helsinki, among other participants, wishes to tackle the challenge of hazardous substances in buildings, building sites and building materials.

3.2.4 City of Hamburg, Germany

3.2.4.1 The strategic framework supporting green public procurement

In 2016, Hamburg adopted guidelines for green public procurement (environmental guideline, *Leitfaden Umweltverträgliche Beschaffung*). With the formal adoption of the guide by the Senate on 19.01.2016, it became binding for all procurements. The guideline, renewed in 2019, helps contracting and procurement departments take into account environmental aspects in tendering and contracting procedures. The guideline defines environmental criteria for 19 product groups and includes a negative list of products that are not allowed to be bought with public money.

The environmental guideline as a strategic document in Hamburg clearly prescribes what is to be purchased. It has to be admitted that there is a lack of a transition phase with percentage data to be achieved for the demarcation "still conventional – already sustainable" as well as (so far) detailed monitoring and a "strategy" in the classical sense, nevertheless, the goals are clearly defined.

3.2.4.2 Procurement organisational structure

Hamburg has a centralised procurement system. There are four central purchasing units (*Zentrale Vergabestellen*) in the ministries in Hamburg and 22 procurement offices. Currently, bundling, standardizing and professionalizing of the purchasing organization and its processes are taking place. In the future, there will be only five procurement and contracting centres.

Centralised purchasing is applicable from 100 000 euros and more. The procurement volume in Hamburg in the first half of 2021 was 454,5 million euros. Out of this, 291,7 million euros were construction contracts and concessions.

3.2.4.3 Implementation of GPP

The environmental guideline includes criteria on climate, circularity and chemicals – depending on the product.

Example of the ChemClimCircle criteria in the environmental guideline

The environmental guideline includes a negative list of 14 non-permitted products and product components. Four of these non-permitted products relate to hazardous substances (chlorine-releasing cleaners, paints based on heavy metals, PVC, and herbicides). Besides hazardous substances, the negative list contains criteria for waste avoidance, energy use, biodiversity

⁵⁸ <https://www.hankintakeino.fi/en/keino-services/green-deal-agreement-public-procurement/green-deal-reducing-hazardous-substances>

⁵⁹ <https://interreg-baltic.eu/project/nonhazcity-3/>

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protection, and air quality/climate protection. In addition to the procurement bans, 19 product groups are defined for which further procurement criteria apply.

Climate protection aspects are formulated in the form of energy efficiency criteria. Explicit climate neutrality is only required for the postal service. Criteria regarding packaging are formulated for a few products.

In addition to the product-specific procurement criteria, further recommendations are given in individual cases, including on the avoidance of waste (circular economy). For example, in the product group of electrical appliances, it is recommended that the procurement of grid-powered devices is given priority over the procurement of battery-powered devices. The service group Recycling of Waste is introduced with a note on the possibility of reusing items.

The general environmental standards are overarching criteria for all product groups and also apply to products not mentioned in the guide. They are formulated more as recommendations than product-specific criteria, except in certain cases. For example, the Blue Angel ecolabel (or an equivalent label) is prescribed for the procurement of office paper. For hygienic paper, the EU Ecolabel is mandated.

Unlike the product-specific criteria, the general environmental standards incorporate more aspects of the circular economy (packaging, reparability, recyclable design). The standards for packaging contain, e.g., the following recommendations: "The packaging is recyclable" and "A reusable system is used for the packaging". The reparability should be ensured by a manufacturer's declaration of the long-term availability (at least five years) of spare parts. The climate aspect is taken into account in the general environmental standards in the form that the use of emission-free or low-emission vehicles is to be preferred for delivery and transport.

The European environmental management system EMAS, ISO 14001 and two German environmental management systems are recommended. In addition, the general environmental standards describe seven recommendable quality seals or ecolabels to be considered in the tender (Blue Angel, EU Ecolabel, EU Energy Label, Austrian Ecolabel, Energy Star, EU Organic Logo, Fairtrade).

The following challenges and identified solutions for implementing green public procurement in Hamburg can be pointed out.

The environmental guideline is an extensive document with detailed criteria for many product groups. This is often a challenge in the daily application in practice. The aim should be to ensure that the criteria are demanding yet practical and in line with market requirements so that there is as little justification for non-application as possible.

The environmental guideline is currently being further developed into the Sustainability Guidelines (*Nachhaltigkeitsleitfaden*, NLF). The NLF aims to make the criteria more demanding. As in the other federal German states, there is yet no comprehensive and data-based monitoring system for sustainable procurement. However, a corresponding tool is currently being developed for monitoring sustainable procurement processes.

Procurement officers are trained in sustainable procurement. Hamburg has also joined the federal and state training initiatives on sustainable procurement. Together with other federal states and the Competence Centre for Sustainable Procurement, uniform training concepts are

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developed, and trainers are qualified. The procurers, for their part, have many years of knowledge of the market and have developed their own networks at the state and national levels. They are very well trained or read up on the topics, and there are enough experts available within the department and environmental agency for "tricky questions", who in turn can also access the nationwide networks.

3.2.5 Municipality of Smiltene, Latvia

3.2.5.1 *The strategic framework supporting green public procurement*

There are no regional or local strategies and action plans developed solely for promoting GPP in Smiltene. Still, some local-level strategies and action plans emphasise GPP:

- 1) Action Plan of Development Programme of Smiltene Municipality. This document defines several activities that are intended to promote GPP:
 - Sub-activity "Application of GPP criteria in municipal procurements" under action "Development of Municipal Management";
 - Sub-activity "Support for organic agriculture, shortened food supply chains, GPP application for food procurements" under activity "Promotion of Rural Development & Promotion of Framing Land Usage".
- 2) Sustainable Energy and Climate Action Plan of Smiltene Municipality 2020–2030.⁶⁰ The Sustainable Energy and Climate Action Plan has a whole chapter focused on the application of GPP in municipal procurements. It states that applying GPP ensures following the long-term environmental goals of Smiltene Municipality. The ratio of growth of GPP proportion compared against all municipal procurements is one of the indicators of the Action Plan implementation evaluation.

However, there is no specific support system for GPP except the consultations with the National Procurement Monitoring Bureau on legal matters.

3.2.5.2 *Procurement organisational structure*

Smiltene County Municipality carries out centralised procurements. The Legal Department has the main responsibility for procurements, and it organises procurements for all needs of municipal institutions. Other departments and municipal organisations should provide the necessary information to elaborate on technical specifications. However, they are often unaware of GPP criteria, and therefore, the GPP criteria are included by the Legal Department. For example, the Legal Department organises the procurement of food products for all schools in the county. The Procurement Commission of the County Municipality prepares procurement documentation and checks its conformance with the normative regulations. The municipality is trying to combine the procurements and prepare one larger procurement with several sections/lots, for instance, in the maintenance of roads.

3.2.5.3 *Implementation of GPP*

Currently, Smiltene Municipality is following minimum legal requirements for applying GPP as established in the national regulation, but it is planned to set higher requirements with on-top requirements in the future. This could be done by defining additional relevant criteria for product groups. Probably the largest concern is cost increase for several groups of products or services.

⁶⁰ https://smiltenesnovads.lv/wp-content/uploads/IEKRP_2_da%C4%BCa_Smiltene.pdf

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However, the price increase can be mitigated by a longer life-cycle of the products in order to justify the GPP application.

In 2022, Smiltene Municipality carried out:

- 52 open procurements, out of which 20 included GPP requirements;
- 38 small procurements, out of which 4 included GPP requirements;
- 12 negotiation procedures, out of which 3 had GPP requirements.

The total volume of public procurement was 15,2 million euros in 2022. The largest product and service groups in the total value of contracts awarded are the following:

- Construction (including technical design),
- Supply of catering and food products,
- Maintenance of streets and roads,
- Transportation and electricity services.

The most common GPP criteria have been the distance of delivery, the requirements for vehicles (Euro 6 or Euro 5), and food products certified by food quality schemes⁶¹.

The chemicals and circularity criteria have not been taken into account in the procurements, but the Municipality of Smiltene is planning to use them, as the national legal acts will require sustainability criteria. E.g., life cycle/circularity costs will have to be applied when buying electricity-consuming products, design services, construction and other procurements.

Another issue is learning to adapt to the new requirements for GPP, which is a time-consuming process. There is a limited number of suppliers in the country who can deliver following GPP requirements. There are still a lot of unanswered questions on how to include GPP requirements in the procurement documentation so that they are proportionate and appropriate. Time and human resources are necessary for the preparation of high-quality procurement documentation.

3.2.6 Municipality of Taurage, Lithuania

3.2.6.1 *The strategic framework supporting green public procurement*

There is no local or regional GPP strategy in Taurage. The municipality administration set a goal for GPP of 30% of the total value of contracts. The goal was achieved in 2022 when the share of GPP by total value was 80,5%. However, there is no analysis of which GPP criteria these procurement documents contained: 1) environmental criteria from the order of the Minister of the Environment, 2) ecolabel, 3) environmental management system, or 4) criteria voluntarily defined by the contracting authority. According to the national target, since 2023, all public procurements must be GPP, i.e. include at least one criterion out of the four abovementioned types.

3.2.6.2 *Procurement organisational structure*

The Public Procurement Department of Taurage Municipality is responsible for documentation and control, while every department can initiate public procurement. Depending on the value of the procurement, the procurement can be initiated by a single person (approved by the administration), or it must be carried out with the public procurement committee.

⁶¹ <https://www.zm.gov.lv/en/food-quality-schemes>

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From January 1, 2023, the city administrations in Lithuania have become central procurement organisations that carry out all public procurement from 15 000 euros and above. They can set up a municipal organisation that carries out procurement or act as a central procurement organisation itself. Taurage Municipality administration is a central procurement organisation for the Taurage district municipality.

In 2022, the total volume of procurement was 20,6 million euros, and the total number of procurements was 647 in Taurage Municipality.

There is a network of green public procurements in Lithuania, i.e., every municipality must have a contact person for green public procurement. They share information on GPP seminars, info sessions, and changes in the legal order of GPP.

3.2.6.3 Implementation of GPP

Taurage follows the national regulations on GPP and has not specified municipality-level procedures and rules for GPP. Similarly, the Public Procurement Office of Lithuania provides guidance and materials on GPP, but there is a lack of more specific tips and advice.

The department that initiates public procurement and the Public Procurement Department of Taurage Municipality formulate GPP and select the criteria. The municipality uses the criteria of the national GPP legal order. The top-down GPP approach is preferred since procurers often do not have an environmental background, while in green public procurement, environmental considerations need to be understood. Using the national GPP criteria is the easiest and safest way not to risk being sued by suppliers or not having any suitable offers.

There is no internal GPP monitoring or evaluation system – monitoring is done through the website of the Public Procurement Office of Lithuania.⁶²

The share of GPP by total value in 2022 was 80,5%, and the share by total number was 14,1%. The biggest product/service groups procured are the following:

- Office equipment,
- Medical equipment,
- Construction and infrastructure works,
- IT services.

3.2.7 City of Šiauliai, Lithuania

3.2.7.1 The strategic framework supporting green public procurement

There is no local GPP strategy or action plan in place in Šiauliai.

3.2.7.2 Procurement organisational structure

From January 1, 2023, a budgetary institution, "Šiauliai Accounting Center", carries out public procurement procedures of budgetary and public institutions controlled (managed) by the municipality. The procurement division of Šiauliai Municipality is responsible for public procurement planning, management, consulting and reporting. However, every department can initiate public procurement. Two persons are responsible for GPP and communication with the

⁶² <https://vpt.lrv.lt/lt/statistika-ir-analize/pirkimu-vykdytoju-zemelapis-svieslente-1>

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Ministry of Environment on this issue: one person from the procurement division and one from the City Management and Environment Department.

In 2022, the total volume of procurement was 53,6 million euros, and the total number of procurements was 362 in Šiauliai Municipality.

3.2.7.3 Implementation of GPP

The City of Šiauliai has not defined its GPP objectives, targets, or priority product groups in addition to the national regulation. The City has some guidance and materials from the Public Procurement Office of Lithuania, but more specific support for the local authority is needed.

GPP focuses mainly on national-level mandatory GPP product groups and criteria. An environmental management system is one of the most often used requirements in GPP. The qualification requirement for an environmental management system has mainly been stipulated in construction, road maintenance and other infrastructure service procurements. Euro 6 standards for vehicles and Oeko-Tex® Standard 100 labels for garment fabrics have been used. There is no practice in applying an integrated approach (ChemClimCircle) to set sustainability criteria for different product groups.

Similarly to Taurage, monitoring of GPP in Šiauliai is done on the national level through the website of the Public Procurement Office of Lithuania. There is a need for additional control mechanisms to implement GPP fully, including follow-up of agreed criteria during the execution of the contract. It is difficult to check during the implementation of the contract whether the producers apply the standards and how much the product corresponds to what was declared.

The share of GPP by total value was 86%. The biggest product/service groups procured by the City of Šiauliai are construction and infrastructure works and city maintenance services (street cleaning and maintenance of parks and squares).

3.2.8 Municipality of Dąbrowa, Poland

3.2.8.1 The strategic framework supporting green public procurement

There is no local or regional GPP strategy in Dąbrowa. The municipality administration does not set any goals or objectives related to GPP. Since the GPP consideration is not mandatory in Poland, usually, small municipalities do not extend their activities beyond what is required by law.

3.2.8.2 Procurement organisational structure

The Public Procurement Department of Dąbrowa Municipality is responsible for all documentation and control of public procurements. It consists of one employee who has to address all the issues related to public procurements. Every other department can initiate a public procurement procedure, and the work is split between the content (relevant department) and procedural issues (public procurement department). Depending on the value, the procurement can undergo a simplified procedure (below 29 000 €) or a regular procedure (over 29 000 €).

In 2022, the Municipality of Dąbrowa launched 7 public procurements (orders over 29 000 €), out of which none were marked as GPP in the public procurement register. The total volume of these procurements was 1 211 000 €, including renovation of buildings (333 042 €) and thermal modernisation of buildings (254 362 €).

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3.2.8.3 Implementation of GPP

Since there are no local/regional guidelines, Dąbrowa follows the national regulations on public procurement. The Public Procurement Office of Poland provides guidance and materials on GPP, but there is a lack of capacity in the municipality to include environmental criteria in complex procedures of public procurement.

Moreover, several public procurements conducted in the municipality (e.g., related to the insulation of buildings) could have been interpreted and reported as green public procurements. However, as there are no incentives, goals, or obligations, no one is interested in documenting these public procurements as GPP.

3.2.9 Municipality of Sopot, Poland

3.2.9.1 The strategic framework supporting green public procurement

In recent years, Sopot has become a leader in sustainable development, with a strong focus on green initiatives and environmental protection. One of the ways that the city is promoting sustainability is through public procurement, which includes both regular public procurement and green public procurement. There is no specific local or regional GPP strategy in Sopot. However, the municipality administration aims to increase a share of GPP in the total value of public procurement. Even though the system of GPP in Poland is not mandatory, several procurements in Sopot have been classified as GPP.

3.2.9.2 Procurement organisational structure

The Public Procurement Department of Sopot is responsible for all documentation and control of public procurements. It consists of several employees who have to address all the issues related to public procurements. Every other department can initiate a public procurement procedure, and the work is split between the content (relevant department) and procedural issues (public procurement department). Depending on the value, the procurement can undergo a simplified procedure (below 29 000 €) or a regular procedure (over 29 000 €).

According to data from the Public Procurement Bulletin, in 2021, Sopot had 270 public procurement contracts (a slightly lower number than in 2020 – 294). However, the total value of these contracts was higher than in 2020, at 130 464 444 PLN (approximately 33 million €). Similarly to the year 2020, the majority of the contracts in 2021 were in the construction category, with a total value of 77 163 073 PLN (approximately 19 million €).

3.2.9.3 Implementation of GPP

Sopot follows the EU and national regulations and recommendations on GPP. Until now, Sopot has not defined specific municipality-level procedures and rules for GPP. The Public Procurement Office of Poland provides guidance and materials on GPP, but there is a lack of mandatory requirements and incentives to use GPP procedures, so only dedicated and aware public authorities use GPP as a standard. Sopot is on a good path to increasing the uptake of GPP.

In 2020, Sopot had a total of 11 green public procurement contracts, with a total value of 5 172 058 PLN (approximately 1,3 million €). In 2021, Sopot increased its focus on green public procurement, with a total of 19 contracts. The total value of these contracts was also higher than in 2020, at 7 960 331 PLN (approximately 2 million €). The categories covered by these contracts

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were similar to those in 2020, with a focus on waste management, renewable energy, and sustainable transport.

3.2.10 City of Stockholm, Sweden

3.2.10.1 The strategic framework supporting green public procurement

The City of Stockholm's programme for strategic purchasing⁶³ and the environment programme⁶⁴ guide the work on green public procurement in the city. The Stockholm environment programme states that the City's procurement processes should be used as a tool to reach environmental goals, and the Environment and Health Department should support the City's departments and administrations with sustainability criteria and follow-up of the same criteria. There are also connected action plans: a chemical action plan with prioritised procurement areas for chemical criteria (see Table 4), an action plan on sustainable use of plastics, an action plan on biological diversity, an action plan on reduced dispersion of microplastics, a climate action plan, etc. These action plans lay down the ways in which the whole City should work to reach goals on different sustainability topics. As part of the action plan for the sustainable use of plastics, the plastics strategy integrates chemicals, climate and circularity.

Table 4. Prioritised procurement areas for chemical criteria in the Chemical Action Plan of Stockholm

Prioritised contract areas for chemical criteria according to the Chemical Action Plan	
<p>Consumables:</p> <ul style="list-style-type: none"> • Creative materials • Hygiene and home-related articles • Chemical products and cleaning utensils • Office and school supplies • Kitchen and household items • Paper and plastic consumables • Health care and incontinence articles 	<p>Other areas:</p> <ul style="list-style-type: none"> • Graffiti removal and cleanup • Toys and sports utensils • Food contact materials • Furniture, textiles and light sources • Cleaning services • Medical technical equipment • Printing services • Laundry and textile services • Vehicles • Workwear and shoes
<p>IT- equipment:</p> <ul style="list-style-type: none"> • Audiovisual (AV) articles • Computers and network • Printers and document production • IT supplies 	

Stockholm City's 2023 budget refers to the following focus areas, which require work connected to the City's purchasing processes, including procurement:

- Work towards more sustainable and less use of plastics according to the action plan on sustainable use of plastic.
- Increase the support from the Chemical centre for chemical criteria in procurement to the rest of the City.
- Introduce a function for coordinating sustainability issues in the procurement and purchasing processes.

⁶³ <https://edokmeetings.stockholm.se/welcome-sv/namnder-styrelser/fastighetsnamnden/mote-2019-11-26/agenda/bilaga-1-stockholms-stads-program-for-inkoppdf?downloadMode=open>

⁶⁴ https://international.stockholm.se/globalassets/rapporter/environment-programme-2020-2023_ta.pdf

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- In collaboration with the City's Executive Office and the Service Department⁶⁵, the Environment and Health Department should ensure that environmental criteria are included in the purchasing processes for the centrally procured contract areas and support other departments and municipal companies to do the same in their local contracts.

3.2.10.2 Procurement organisational structure

A schematic view of the purchasing process in the City of Stockholm is shown in Figure 3. Central procurement areas are managed by the Service Department or the City's Executive Office. Local procurements are organised in the City district departments and other administrative units. Joint contracts between different local units can be made by the Service Department as a consultant service or by some City district departments or others who decide to join forces. The Education Department and the Sports Department, as examples of specific departments, conclude many local contracts and have their own procurement staff. These persons need support in their procurement processes from the Chemical centre, Energy centre, climate experts and the Circularity centre in order to fulfil the goals of the City's environment programme. Another important factor is the key feedback processes – the purchasing process is not linear but a cycle in which expert functions and feedback need to be present all through in order to have the best effect. Experiences from the previous contract period need to be taken into account in the next procurement process.

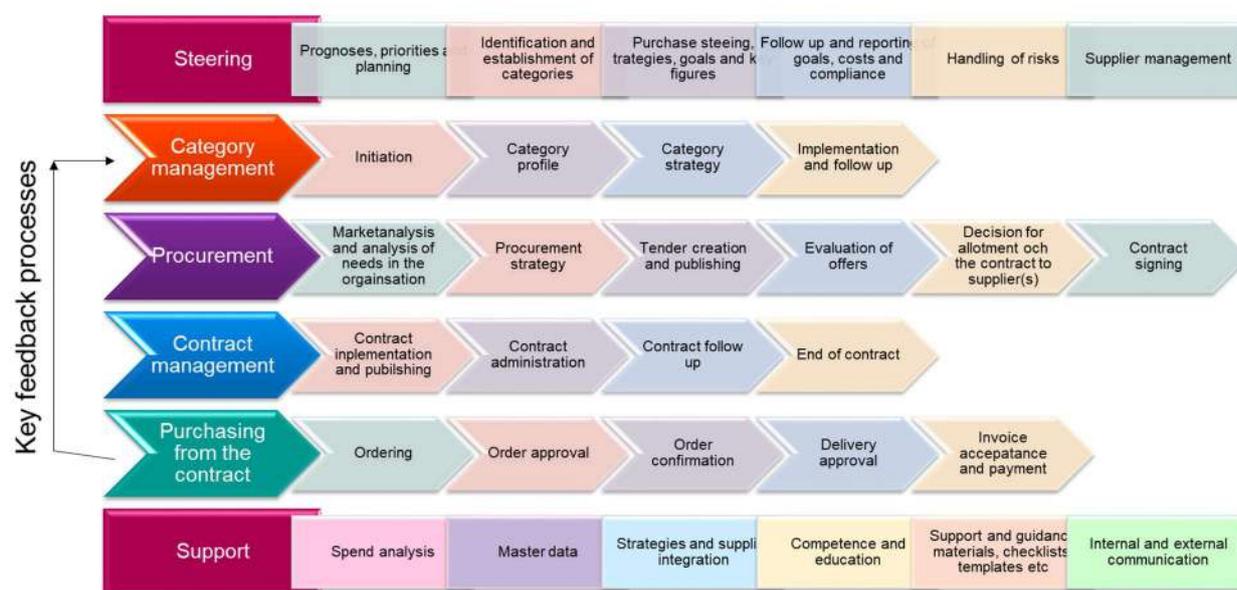


Figure 3. Schematic view of the procurement process in the City of Stockholm

In 2021, the total spending increased to 42 billion SEK in the City of Stockholm. Out of this amount, the purchases by municipal companies accounted for approximately 40%, and purchases by city departments (administrations and city districts) 60%.

3.2.10.3 Implementation of GPP

The City's programme for strategic purchasing includes guidance for implementation.

⁶⁵ Central unit of the City of Stockholm, responsible for many of the central contracts, among other things.

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In 2022, the City of Stockholm carried out 576 procurements. The largest product and service groups by value in order from higher to lower numbers are building and construction; healthcare and nursing homes (residences); facility management (FM) services and rent; technical consultants; IT; management of buildings; streets and parks; external services; waste and waste management framework; food and food services; HR; construction materials; consumables; travel and conferences, etc.

According to a newly implemented system where the procurement officer has to tick a series of boxes stating which sustainability goals the tender adheres to before publishing the tender, 78% of tenders included criteria for social benefits, and in 56% of the 576 procurements, environmental criteria were used, in 2022. The contract areas where criteria for hazardous substances have to be utilized and thus marked in the procurement system are listed in Table 4 above.

Although the monitoring process is becoming clearer, it has been largely unclear in connection to contract control and follow-up. There is a need for more procurement officers and contract controllers to have dialogue meetings with all relevant contracted suppliers for follow-up of criteria during the contract period. Also, more time would be needed to perform chemical analyses.

3.2.11 City of Västerås, Sweden

3.2.11.1 The strategic framework supporting green public procurement

Since 2020, all municipal public procurement projects have been analysed and guided for general sustainability requirements by a dedicated sustainability function in the Procurement Department. This includes but is not limited to climate impact and chemical risks.

Västerås City Purchasing and Procurement Policy⁶⁶ (revised in 2017) includes GPP. A new revision of the policy document is planned to be accepted in the second half of 2023.

Priority product groups of procurement are products in contact with children, plastics and vehicles.

Västerås has adopted the Chemical Action Plan 2020–2025⁶⁷ and the Action Plan for a Sustainable Use of Plastics 2022–2025⁶⁸.

According to the Chemical Action Plan, the City shall:

- Include chemical requirements in all tenders, follow up chemical requirements in at least 20% of tenders, and the amount of environmentally certified products shall increase from 2020 to 2024;
- Ensure the fulfilment of the role of sustainability expert in the procurement department;

⁶⁶ https://www.vasteras.se/download/18.6069dd5f15a6054f85f2524/1554824238112/Ink%C3%B6ps-och_upphandlingspolicy_rev_2017.pdf

⁶⁷

https://www.vasteras.se/download/18.1acbbd351750766b9511c730/1602678454757/V%C3%A4ster%C3%A5s_%20stads%20handlingsplan%20f%C3%B6r%20kemikalier%202020-2025.pdf

⁶⁸

<https://www.vasteras.se/download/18.a216001869c95671a1f71d/1678104113511/Handlingsplan%20för%20en%20hållbar%20plastanvändning%202022-2025.pdf>

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- Carry out a regular follow-up on chemical requirements stipulated in procurement criteria.

Table 5. Prioritised procurement areas for chemical criteria in the Chemical Action Plan of Västerås

Prioritised contract areas for chemical criteria according to the Chemical Action Plan
<ul style="list-style-type: none">• Chemical products• Hygiene products• Building materials• Textiles• Furnishing• Electrical and electronic products• Toys and other products directed at children• Pesticides• Pharmaceutical• Microplastics• Food contact materials

The Action Plan for a Sustainable Use of Plastics includes guidance for sustainable procurement and purchasing of plastics.

3.2.11.2 Procurement organisational structure

A central unit of the City of Västerås performs all the procurements mentioned in EU and national legislation (e.g., over 100 000 SEK, approximately 10 000 euros). Below that threshold, individual purchases are allowed, with the use of templates from the central unit to ensure compliance with national legislation and municipality rules.

3.2.11.3 Implementation of GPP

Västerås has adopted an internal procurement procedure for GPP. Expert support is provided by two city officials. Environmental/sustainability procurement criteria are used in all tenders where the sustainability requirements are relevant according to the City of Västerås Chemicals Action Plan, Swedish and EU legislation, and other requirements based on knowledge.

The selection of criteria is based on the competence and experience of the City, the knowledge gained from municipalities' networks, criteria by the National Agency for Public Procurement, and following environmental certification requirements.

The main barriers to full implementation of the GPP and ChemClimCircle approach are connected to monitoring and follow-up on contracts. There is a need for more procurement officers and contract controllers.

The total volume of public procurement in Västerås is about 350 million euros. The biggest product and service groups in the total value of contracts awarded are:

- Construction and renovation of public schools, preschools and elderly care homes
- Food for schools, preschools and elderly care homes
- Operating elder care (entrepreneurs)

3.2.12 Comparative analysis of the key findings

The following comparative summary outlines the main differences and similarities between the analysed municipalities on three levels related to procurement: strategic, organisational and operational. Subsequently, the main barriers arising from the strategic framework, organisational

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set-up and operational practices are identified based on the questionnaires to the project partners.

3.2.12.1 Strategic framework

Similarly to the national-level approaches, two groups of countries can be distinguished based on how municipalities implement GPP locally (Table 6). In the Baltic States and Poland, local authorities mostly follow the GPP requirements set in the national regulation and have not adopted city-specific GPP objectives or priority areas.

A more bottom-up approach is used in municipalities of other (mainly Nordic) countries. Accordingly, these municipalities have defined their specific focus areas for GPP. In Helsinki and Stockholm, the city's strategic focus areas address, among others, climate and circularity, which are also followed in GPP. In addition, Helsinki has committed to enhancing responsible public procurement.

Stockholm and Västerås have uniquely highlighted the aim of a toxic-free environment among their strategic environmental objectives. In Stockholm, a toxic-free environment is one of the key goals in the City's environment programme and thematic strategies (e.g., sustainable use of plastics). Thus, the ChemClimCircle approach has been integrated most fully into the strategic documents of the Swedish municipalities.

Hamburg has not adopted a strategic policy document for GPP but has provided directions at the guidance level.

Only very few analysed municipalities have set themselves quantitative targets for GPP. Taurage Municipality administration adopted a target of achieving a 30% share of GPP in the total cost of contracts. In the Sustainable Energy and Climate Action Plan of Smiltene Municipality, the growth ratio of GPP compared against all municipal procurements is one of the evaluation indicators.

Table 6. Municipality-level strategic documents on GPP

Municipality	Strategic document for GPP	Strategic focus areas of GPP
Gentofte, DK	Procurement Policy: Procurement with a sustainable balance 2022–2026	Climate and environmental sustainability: <ul style="list-style-type: none"> reduction of climate footprint, circular economy, including waste prevention and avoiding unnecessary purchases
Tallinn, EE	No strategic document adopted	None
Helsinki, FI	City of Helsinki procurement strategy, focusing on responsible procurement, with the implementation guidance, incl. criteria bank	Environmental impacts include: <ul style="list-style-type: none"> carbon neutrality, circular economy, biodiversity Also, social, ethical and economic responsibility are taken into account.
Hamburg, DE	The strategic document at the city level is the guidelines for green public procurement	None
Smiltene, LV	Action Plan of Development Programme of Smiltene Municipality includes GPP	None
Šiauliai, LT	No strategic document adopted	None

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Taurage, LT	No strategic document adopted	None
Stockholm, SE	City of Stockholm programme for strategic purchasing, environment programme and action plans with prioritised procurement areas	Procurement must contribute to the goals of the City's environment programme, incl.: <ul style="list-style-type: none"> • fossil-free and climate-positive city, • climate adaption, • circular economy, • biodiversity, • clean air and a good auditory environment, • toxic-free environment
Västerås, SE	Policy document on public procurement, including GPP, exists but needs updating.	Environmental impacts, social and ethical responsibility

The total volume of public procurement varies largely in the analysed municipalities, depending on their size (Table 7). However, these numbers may not be fully comparable due to different calculation methodologies (i.e. which procurement thresholds and procuring entities are taken into account). Despite the possible calculation differences, the large amounts of public procurement in many municipalities indicate that public purchasing is a viable means to reach the municipalities' environmental goals.

Table 7. Total volume of public procurement in the analysed municipalities

Municipality	The total volume of public procurement (year)
Gentofte	270 million euros annually
Tallinn	550 million euros (2022)
Helsinki	4000 million euros annually*
Hamburg	454,5 million euros (1 st half of 2021)*
Smiltene	15 million euros (2022)
Taurage	17,6 million euros (2022)
Šiauliai	53,6 million euros (2022)
Dąbrowa	1,2 million euros (2022)
Sopot	33 million euros (2021)
Stockholm	4200 million euros (2021)*
Västerås	350 million euros annually

* includes procurements by the city departments and municipal companies.

3.2.12.2 Organisational set-up

All analysed municipalities use a combination of centralised and decentralised procurement models. Usually, the procurement, service or legal department handles purchasing products and services that the whole city organisation needs, such as energy and fuels, IT equipment and services, cleaning agents, furniture, travel agency services, and office supplies. Other city departments/divisions carry out specific procurements related to their field.

Internal cooperation and expert support from sectoral departments/municipal institutions are needed in both procurement models, especially when elaborating on the technical specifications and setting requirements for products and services.

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Tallinn and Lithuanian local governments have appointed their contact persons for GPP. The number of persons coordinating GPP issues in Tallinn and Taurage, respectively, is one; in Šiauliai, two – from the procurement division and from the City Management and Environment Department. On the contrary, the Nordic municipalities, especially Stockholm, have much higher capacity in GPP. In Stockholm, the procurement officers get support from the chemical centre, energy centre, climate experts and the circularity centre. In Gentofte, an environmental economist and a climate economist belong to the department of Tenders, Contracts & Climate Economics.

Another difference between the western and eastern Baltic Sea Region municipalities is the experience in combining the procurement actions of two or more municipalities and buying jointly or the presence of a central purchasing body. In Finland, Sweden and Denmark, joint procurement of municipalities or adherence to contracts provided by the central purchasing body is more common, and the environmental awareness in purchasing is higher. In addition, there are national or regional competence centres that support and increase competence to implement green public procurement, such as:

- KEINO – a network-based competence centre for sustainable and innovative public procurement in Finland;
- Adda AB – central purchasing body and support for the public sector owned by the Swedish Association of Local Authorities and Regions;
- POGI – the Partnership for Green Public Procurement in Denmark;
- KOINNO – the Competence Centre for Innovative Procurement, and KNB – Competence Centre for Sustainable Procurement in Germany.

3.2.12.3 Operational procurement process

GPP process

The product and service groups for which GPP criteria are applied vary in the analysed municipalities. In general, the Baltic States and Poland have relatively short experience in GPP. Therefore, their GPP focus has been on product and service groups that are large-scale (e.g., construction, road maintenance, waste management) or for which environmental requirements derive from EU legislation (such as emission standards for buses and other vehicles). Since establishing mandatory product groups and GPP criteria at the national level, the Estonian, Latvian and Lithuanian municipalities rely mainly on these product groups and criteria in GPP. The number of national-level mandatory product groups is as follows:

- Estonia – 5
- Latvia – 7
- Lithuania – 32

The Nordic municipalities have a long tradition in GPP, and hence, GPP has been applied to a wider range of product groups. The selection of GPP criteria is based on internal GPP guidelines for product groups where the national agency has not provided criteria. Hamburg has defined the mandatory product groups (19) in its GPP guidelines. Helsinki, Stockholm, Västerås and Gentofte have also defined certain product groups where the GPP criteria have to be applied. However, the application of criteria depends on the article type or procurement area. The examples of support tools and systems to foster GPP in the Nordic and German local authorities are given in Table 8.

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Table 8. Selection of support tools and systems for GPP in five municipalities

Municipality	Tool	Description
Gentofte, DK	3-in-1-Model	Collaboration and dialogue to prepare the procurement
Helsinki, FI	Responsible procurement process guide, criteria bank with examples, mandatory criteria, product category prioritisation, green deal agreements and internal network for responsible procurement	Guidance that supports the implementation of the City of Helsinki Procurement Strategy
Hamburg, DE	GPP guidelines	Environmental criteria and negative list
Stockholm, SE	Chemical centre, energy centre, climate experts and circularity centre in the City of Stockholm	Support for setting the criteria in procurement by participation in the whole purchasing process
Västerås, SE	Action Plan for a Sustainable Use of Plastics	Guidance for sustainable procurement and purchasing of plastics

Use of the ChemClimCircle approach in the procurement process

As part of the GPP mapping, we also studied the use of the ChemClimCircle approach in the municipal procurement processes. For this purpose, we defined 31 relevant product and service groups (see Annex 2). Within these groups, six partner municipalities and associated municipalities (Helsinki, Stockholm, Smiltene, Šiauliai, Tallinn and Taurage) analysed their procurement practices in choosing the sustainability criteria. The criteria cover the topics of climate, circularity, chemicals and other relevant sustainability areas (see the thematic areas of criteria in Annex 3). For facilitating the analysis, the product groups and sustainability criteria were arranged as a matrix in an Excel file (Annex 4).

The results of this analysis show that the ChemClimCircle approach is not common in the analysed municipalities. The simultaneous application of procurement criteria related to climate, circularity and chemicals is limited to three product groups (Figure 4):

- Work clothes;
- Renovation services and products;
- ICT equipment.

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Figure 4. Use of criteria related to climate, circularity and chemicals in procurements of six analysed municipalities

The ChemClimCircle approach has been used in Helsinki and Stockholm, whose respective procurement examples are provided in Table 9.

Table 9. Examples of using criteria for climate, circularity and chemicals in procurements of Helsinki and Stockholm

Procurement	Sustainability area	Thematic area of criteria
	Climate	GHG and air pollutant emissions reduction
	Circularity	Durability and lifespan extension of workwear by repairing services
		Reuse, refurbishment and repair of workwear

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Procurement of work clothes for the Service Centre Helsinki ⁶⁹		Recycling – materials
		Recycling – products
	Chemicals	Reduction of hazardous substances in products and materials
Procurement of planning and development in the renovation of residential buildings for the City of Helsinki ⁷⁰	Climate	GHG and air pollutant emissions reduction
	Circularity	Durability and lifespan extension
		Reuse, refurbishment and repair
		Recycling – materials
Chemicals	Reduction of hazardous substances in products and materials (ensuring good indoor air)	
Procurement contracts for ICT equipment (computers, tablets, phones and projectors) in the City of Stockholm	Climate	Energy efficiency (e.g. automatic turn off of audio-visual equipment when not in use, requirement for EU energy label C (previously A++)
	Circularity	Reuse, refurbishment and repair (e.g. computers which have been used within the city should be refurbished and resold)
		Renting, sharing
Chemicals	Reduction of hazardous substances in products and materials	

In the analysed municipalities, two sustainability areas have been included in the procurement criteria of 14 product groups (Figure 4):

- Circularity and chemicals in 7 product groups;
- Climate and circularity in 5 product groups;
- Climate and chemicals in 2 product groups.

Out of these 14 product groups, criteria for chemicals have been set for 9 product groups:

- Sales/primary packaging
- Group/secondary packaging
- Transport/tertiary packaging
- Bed linen, towels (e.g. pillows, duvets, mattresses)
- Laundry services of textiles, including rental garments and other textiles
- Office supplies (e.g. folders, pens)
- Furniture
- Kitchen appliances
- Ink and toner cartridges

Only one sustainability area is used in the criteria for 8 product groups (Figure 4). Out of these eight groups, criteria for chemicals have been set in 7 product groups:

- Kitchen utensils
- Single-use FCM

⁶⁹ <https://www.hel.fi/static/liitteet/kaupunkiymparisto/ilmastoteot/hankkeet/canemure/case-self-owned-and-rental-work-clothes-with-laundry-services.pdf>

⁷⁰ <https://www.hel.fi/static/liitteet/kaupunkiymparisto/ilmastoteot/hankkeet/canemure/case-planning-and-development-in-the-renovation-of-residential-buildings.pdf>

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- Toys and art/play materials
- Medical utensils
- Interior textiles
- Chemical products for cleaning
- Cleaning service

The relatively high use of chemical criteria in the studied product groups results primarily from the procurements of Helsinki and Stockholm. From other countries, examples of using the national-level mandatory criteria for chemicals in Šiaulai can be given:

- Lithium batteries and batteries for portable ICT equipment.
- Textile products must not contain chemicals recognized as chemicals of very high concern and included in the candidate list of chemicals for authorization (REACH).
- Floor coverings, paints, insulation, doors, windows, panels, etc. – defined concentrations and restrictions for using formaldehyde, volatile organic compounds, lead or cadmium compounds, and other toxic and hazardous compounds.
- Furniture must not contain dangerous chemical substances classified by assigning any of the specified hazard phrases according to Regulation (EC) No 1272/2008; must not have more than 5% of volatile organic compounds; must not contain chromium compounds; formaldehyde emissions must not exceed 0,05 ppm.

In the procurement of computer screens for schools in 2023, the City of Tallinn has requested that the devices meet TCO Certification or equivalent life cycle social and environmental responsibility criteria. The TCO Certification includes mandatory criteria for climate, circularity and safety.⁷¹

No examples were identified for considering climate, circularity or chemicals in procuring the following product or service groups:

- Other plastic bags
- Hygiene articles
- Non-plastic kitchen utensils
- Cleaning utensils
- ICT services

The practice of selecting sustainability criteria in the procurement of construction materials (renovation services and products and maintenance chemicals) will be studied in more detail in the Interreg Baltic Sea Region project NonHazCity3.⁷²

3.2.12.4 Barriers to the implementation of the GPP and ChemClimCircle approach

Several common features can be identified when looking at the challenges and barriers that result in the low uptake of the GPP and ChemClimCircle approach.

At the strategic framework level (Figure 5), the project partners perceived an absence of clear objectives and targets as a main barrier to the effective implementation of GPP in municipalities where GPP strategies/action plans are missing. In the municipalities where the strategic objectives and focus areas have been adopted, there is still a lack of an integrated ChemClimCircle approach. Often, the objectives and thematic areas are elaborated in separate

⁷¹ <https://tcocertified.com/>

⁷² <https://interreg-baltic.eu/project/nonhazcity-3/>

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chapters or even separate strategic documents. This can hinder city officials, including procurers, from understanding the sustainability priorities of the city/municipality. Local government employees may struggle to understand their specific role in meeting sustainability goals.

The municipalities in the Baltic States and Poland, where GPP is introduced mainly via a national-level top-down approach, highlighted that this approach and related legal amendments sometimes create confusion and hinder setting their own local-level GPP priorities and objectives.

Moreover, due to the political cycle, changing political priorities may further complicate the implementation of GPP when political decisions override sustainability objectives.

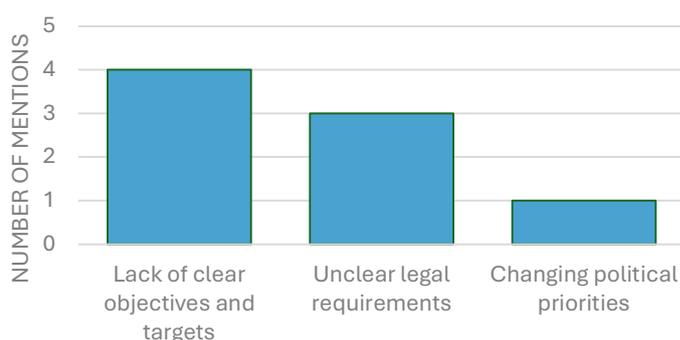


Figure 5. Strategic-level barriers to GPP and ChemClimCircle implementation

On the organisational level (Figure 6), the lack of resources in terms of personnel and time was highlighted by all respondents as two main barriers. These barriers include the lack of municipal employees who are experts in GPP issues as well as employees with environmental and sustainability knowledge (especially on chemicals). Training of municipal procurement employees on GPP and sustainability issues is constantly required.

Other important barriers are related to the insufficient monitoring and follow-up of GPP. Municipalities often do not monitor whether GPP objectives are followed and which environmental criteria are set in the procurement documents. Furthermore, follow-up to see if the contracted suppliers meet the set criteria is often lacking, which results in low knowledge of whether or not the delivered products/services follow the criteria set in tender documents and contracts. Therefore, measuring the uptake and effectiveness of GPP efforts in a total picture is difficult.

Related to the shortage of personnel is the lack of expertise in GPP and sustainability (especially integrated ChemClimCircle), which also was frequently noted in the responses. Even these municipalities with more capacity in terms of expertise (e.g., Stockholm) indicated that internal communication and cooperation between the units is insufficient. Municipalities in the Baltic States and Poland noted that they lack internal and external know-how support for the GPP and ChemClimCircle approach. Partly, the aforementioned barriers are caused by the current organisational set-up and lack of know-how to support the implementation of GPP.

Additionally, the respondents mentioned financial obstacles (e.g., the effects of an integrated approach on costs) as a barrier. Therefore, it is important to support GPP and ChemClimCircle budgeting in municipalities.

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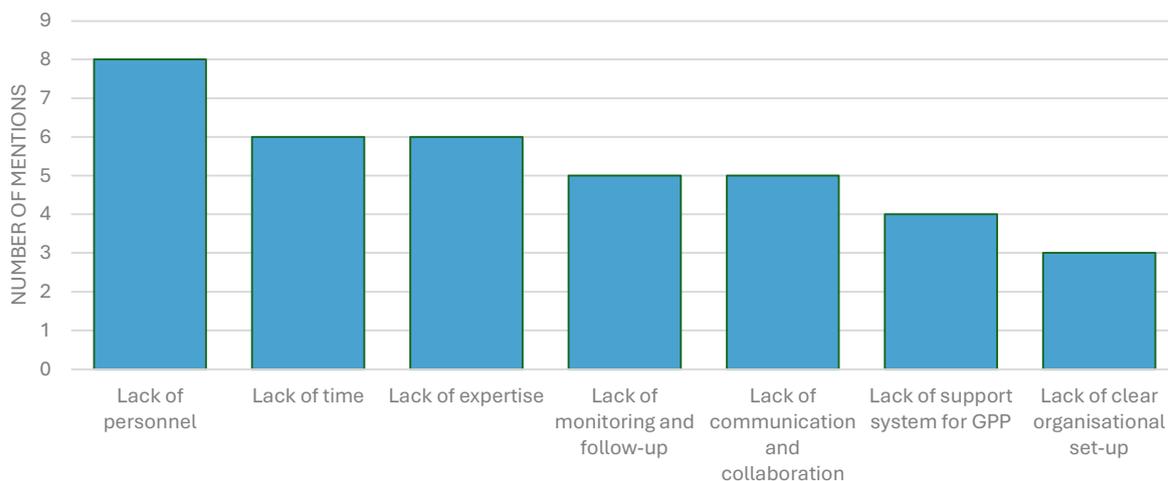


Figure 6. Organisational-level barriers to GPP uptake and ChemClimCircle approach

As the main **operational level** barrier (Figure 7), all respondents indicated an insufficient understanding of the ChemClimCircle approach to procurement in municipalities – in terms of integrating criteria and information on climate effects, circularity aspects, and especially chemical issues. It was expressed by the respondents that there is a need for more information on the chemical aspects of products and services (hazardous substances content, avoiding negative impact, alternatives and examples of setting the relevant procurement criteria).

The municipalities in the Baltic States and Poland lack internal GPP procedures and guidance materials that would allow the procurement officials to set criteria in an agreed and harmonised way.

The lack of potential suppliers was also mentioned. This could be a case in certain product/service groups, especially in smaller countries, such as the Baltic States. However, this concern can possibly be partly explained by a lack of market dialogue in the frame of the procurement process in these countries, meaning that potential suppliers are not known but might as well exist.

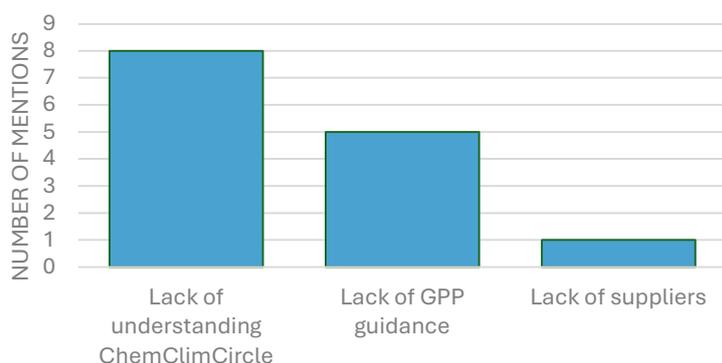


Figure 7. Operational-level barriers to GPP and ChemClimCircle implementation

4. Summary and Conclusions

The importance of promoting an integrated approach in European policy implementation is not new. Policies improving a specific area can generate impacts in other areas, with many possible positive or negative effects (synergies or conflicts). A whole set of mechanisms and practices have been built up in support of the integrated approach to encourage the search for interlinks in policies that create synergies as well as inform the trade-offs that are often inevitably required. The European Green Deal provides a good example of an approach that aims to integrate toxic-free environment, climate and circularity aspects (ChemClimCircle approach). Despite the call for policy integration, the integrated approach to policy implementation is not always the practice.

Green public procurement is a policy tool that can influence the integration of circularity, chemicals and climate aspects into products and services. Thereby, GPP enhances synergies between the three EU policy areas and helps achieve EU environmental policy goals.

In order to integrate circularity, chemicals and climate objectives into public procurement, these areas have to be integrated already at the policy level. Policy 'silos' and isolated objectives, non-integrated guidance and implementation tools, lack of knowledge and coordination, and controversial legal requirements hinder the creation of synergy between circularity, chemicals and climate objectives in procurement.

This study mapped current approaches to green public procurement policy and implementation on all levels in the project partner countries: setting national and local policy directions at the strategic level, procurement management at the municipal organisation level, and implementation of the strategies in practice in procurement processes (operational level). The practice of municipalities shows that GPP uptake on the local level depends to a great extent on the national approach: the existence of a state's strategic vision for GPP and the way of its implementation; top-down, directed by the state, or more flexible, directed by municipalities.

Integrating sustainability criteria into the procurement of products and services is used more in municipalities where GPP application has a longer history. Longer GPP tradition also implies that GPP competence support is available for the municipalities, and the municipalities set their specific GPP goals.

The application of procurement criteria related to the integrated CCC approach is still not common in studied municipalities – examples are limited to three product groups: work clothes, renovation services and products, and ICT equipment.

The main causes behind the low uptake of the GPP and ChemClimCircle approach are related to strategic, organisational, and operational-level barriers: lack of strategic framework (clear objectives and targets), shortage of organisational resources (personnel and time) and insufficient understanding of the ChemClimCircle approach to procurement in municipalities.

To fully utilize the potential of purchasing processes for achieving sustainability goals, the mentioned barriers have to be addressed and challenged, which is the aim of the ChemClimCircle project through training, guidance and suggestions for strategic solutions in the organisations.

Annex 1. Examples of Synergies and Conflicts related to GPP

Possible synergies related to the integration of chemicals, climate and circularity aspects:

Criteria for chemical content increase reuse and recyclability:

- Criteria for less harmful chemicals in the procurement of electric and electronic ICT devices yield an easier recycling process later on and less harmful substance exposure in countries where this equipment is disassembled. This synergy works on other areas of goods and materials as well.
- Types of plastics that are better from a chemical perspective are also better from a circularity view. Polyethylene (PE), polypropylene (PP) and polyethylene terephthalate (PET) are the better types concerning chemical content and also the ones that are the easiest to recycle in the current systems. This means fewer harmful substances in circulation compared to some other plastic types.

Less use of (new) plastic:

- Recycled plastics in articles and packaging materials have a climate-positive effect since new fossil raw materials are not used or incinerated as waste.
- Change from single-use to continuous-use items gives a synergy: less plastic, a smaller climate footprint and a more circular approach. For example, textile napkins instead of plastic ones can be washed and used many times and then recycled into other textile items, although some energy is involved in the wash cycles. Multi-use items might sometimes need to be used 450 times for it to be a positive trade-off; how do we make sure that this is done?
- There is a need to steer towards less plastic use (more wood, glass and metal multi-use items) but also a need to steer towards more circularity, reuse of items many times, and then reuse of materials to make new items.
- Textiles – natural fibres versus synthetic (plastic) textiles with flame-retardant additives. For creating a synergy, it is better to choose natural fibres.

Choice of better plastic types or articles that do not contain plastic materials at all. Specific examples:

- Avoiding polyvinyl chloride (PVC) and polycarbonate (PC) plastics.
 - PVC can contain phthalates, which are toxic to reproduction; the monomers of PVC are cancerogenic, and waste incineration might cause the development of dioxins if not handled properly.
 - i. Choose flooring material that is not made from PVC, polyurethane, linoleum or wood (if possible).
 - PC is made from bisphenol A (BPA), which is a hormonal disruptor.
 - ii. Specify other plastic types, for example, Tritan, which is a PET-based plastic. Prefer stainless steel, wood or glass for kitchen utensils (when possible).

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- iii. Be sure not to substitute PVC and PC plastics with plastics containing other bisphenols, such as bisphenol S (BPS) and bisphenol F (BPF), since they have similar properties as BPA.

Possible conflicts related to the integration of chemicals, climate and circularity aspects:

Conflicts between recycling (circularity/climate goal) and chemical content:

- Old tires made into infill for artificial turfs.
- PVC flooring material or toys containing phthalates that are toxic for reproduction cannot be recycled.
- Outdoor clothes that are made from uncontrolled recycled plastic sources have a risk of containing hazardous contaminants. When this fabric comes into direct skin contact, these substances might transfer to the garment user. If using more controlled sources, there might be fewer hazardous substances, but this will also mean that plastic of higher quality, for example, food contact material from closed-loop systems, is taken out of that loop and downgraded to materials with less requirement for documentation and certification, thus creating a loss of value. One example of a closed-loop system is Sweden's well-functioning PET bottle circulation system, which has been in service for decades, reusing FCM plastic for new FCM material.⁷³
- Circulating old furniture – chemical risks but climate-positive impact.
- Asphalt made from waste incineration plant ashes.

Conflicts between energy efficiency, insulation, facade materials and chemical content:

- Indoor contamination and outdoor runoff of hazardous chemicals through rainwater.
- Pipe insulation keeps the pipes from emitting heat, but the material contains off-gas chlorinated paraffins.

Conflicts between climate issues in food choices and chemical health risks:

- Hydrogenated vegetable oils, when changing from cows' milk to reduce greenhouse gas emissions (methane from cows' digestive system), as well as aiming to decrease water usage (cattle need a lot of water). The production of solid fat from liquid vegetable oils is done in a manner similar to that of producing paint. This involves different chemical processes, and the end product might contain Non-Intentionally Added Substances (NIAS), including substances that are formed when heating and processing the vegetable oil by other means.

Conflicts between climate and circularity:

- Electrification of the whole society: electric cars are good for climate provided that the electricity is produced without fossil fuels, but worse in a circular view due to rare earth metals needed for batteries, etc. Or, it has to be secured that these metals are taken care of and used again at the end of life for electrical appliances and vehicles.
- More electricity is needed, there is not enough "clean" energy for this transition, electricity shortage can develop, or finite fossil sources are used to produce energy.

Conflicts involving reduced plastic use:

⁷³ <https://pantamera.nu/en/>

Interlinks, conflicts and dependencies between chemicals, climate and circularity aspects in procurement

- Changing from plastics to paper consumables puts a larger footprint in the forestry sector, and good forest management needs to be secured. Growing new forests cannot fully replace the outtake of old forests, and a lot of biodiversity is lost. Examples of articles: coffee cups, paper plates, single-use cutlery, wash napkins, etc.
- Changing to more natural materials in the kitchen supplies, e.g. wooden cut boards instead of plastic – fewer chemical hazards but bigger outtake of the forest, which might make the forest into a CO₂ source instead of a sink.
- Sourcing of biofuel from forests – there is a great difference depending on how the forest is managed.
- FCM glass containers versus single-use plastics. Glass is very heavy and, therefore, takes more energy to transport. In contrast, plastic is lighter and does not have the same risk of being crushed. Glass needs to be used very many times since the production process and recycling demand high temperatures and, thus, high energy consumption (climate issue).

Annex 2. Product and Service Groups Relevant to the ChemClimCircle Approach

Product area	Product and service group
1. Packaging	1. Sales/primary packaging
	2. Group/secondary packaging
	3. Transport/tertiary packaging
2. Textiles	4. Clothes (professional clothing)
	5. Bed linen, towels (e.g. pillows, duvets, mattresses)
	6. Laundry services of textiles, including rental garments and other textiles
3. Plastic-containing consumables	7. Office supplies (e.g. folders, pens)
	8. Kitchen utensils (e.g. dishes, trays, spoons, spatulas)
	9. Single-use FCM (plastic coating)
	10. Waste bags
	11. Other plastic bags (FCM)
	12. Toys and art/play materials for schools, kindergartens, etc.
	13. Medical utensils (e.g. gloves, tubing, bags, plasters)
	14. Diapers, incontinence articles and other hygiene articles
4. Construction material	15. Renovation services and products (paints, flooring material, insulation materials, adhesives and fillers)
	16. Maintenance chemicals (e.g. glues, adhesives, fillers, oils and other chemicals used in the regular maintenance of buildings and things in the building, such as elevators)
5. Furniture and interior textiles	17. Furniture
	18. Curtains, carpets and other interior textiles
6. Food and catering	19. Food and drink products
	20. Kitchen appliances (e.g. fridges, ovens, cookers, coffee machines)
	21. Non-plastic kitchen utensils (from materials such as wood, stainless steel, silicone, and bamboo)
	22. Catering services
7. Cleaning	23. Chemical products for cleaning
	24. Cleaning appliances/devices (e.g. pressure cleaners, sweepers, polishers, vacuum cleaners)
	25. Cleaning utensils (e.g. microfiber cleaning cloths, mops, sponges, brooms, buckets)
	26. Cleaning services
8. Information and communications technology (ICT)	27. ICT equipment – computers, tablets, phones, projectors
	28. ICT equipment – printers
	29. Ink and toner cartridges
	30. ICT supplies (e.g. cables, chargers, batteries)
	31. ICT services

Annex 3. Thematic Areas of Procurement Criteria Relevant to the ChemClimCircle Approach

Sustainability area	Thematic area of procurement criteria
1. Climate neutrality	1. Energy efficiency
	2. Renewable energy use
	3. GHG and air pollutant emissions reduction
2. Circular economy	4. Durability and lifespan extension
	5. Waste prevention and reduction (e.g. food waste prevention or reduction of material/packaging use)
	6. Reuse, refurbishment and repair
	7. Recycling – recycled materials in products
	8. Recycling – (easy) recyclability of products
	9. Renting, sharing (buying service instead of product)
3. Non-toxic environment	10. Content of hazardous substances in products and materials
	11. Avoidance of materials and products (e.g. certain types of plastics, paints) that have health or environmental risks of chemical substances during the following life cycle stages:
	a. in production
	b. in use stage
	c. in waste management
4. Other	12. Additional information and awareness raising (suppliers should provide specific information/training concerning environmental aspects of products and services, e.g. chemicals' risks)
	13. Environmental management measures (e.g., the existence of an environmental management system)
	14. Water saving (e.g. water consumption efficiency, technological and operational measures)
	15. Sustainable natural raw materials (other than recycled materials and materials containing harmful chemicals), e.g. natural, bio-based or organic materials
	16. Life cycle costing
	17. Other (e.g. ecological diversity and nature preservation, social sustainability)

Annex 4. Matrix for Analysing the Use of Sustainability Criteria in Product and Service Groups

Product area*	Product and service group*	AREA OF SUSTAINABLE/GREEN CRITERIA**																		
		Climate			Circularity					Chemicals			Other							
		1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.			12.	13.	14.	15.	16.	17.
										a.	b.	c.								
1.	1.																			
	2.																			
	3.																			
2.	4.																			
	5.																			
	6.																			
3.	7.																			
	8.																			
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	12.																			
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8.	24.																			
	25.																			
	26.																			
	27.																			
8.	28.																			
	29.																			
	30.																			
	31.																			

* See the list of product and service groups in Annex 2.

** See the list of thematic areas of procurement criteria in Annex 3.