# TABLE OF CONTENTS

Executive Summary .................................................................................................................. 3
Introduction ................................................................................................................................. 4 – 7
The need for a Joint Waste Management Strategy for the Baltic Sea Region ................................................................................................................................. 8 – 10
A broad picture of the region ....................................................................................................... 11 – 12
The vision .................................................................................................................................. 13 – 15
The BSR Strategy for Waste Management
   Strategy cornerstones ............................................................................................................. 16 – 18
   Challenges and strategy actions ............................................................................................ 19 – 34
General recommendations ......................................................................................................... 35 – 39
Key messages ............................................................................................................................... 40 – 41
Future steps ................................................................................................................................ 41 – 42
Appendix 1. Waste management hierarchy .................................................................................. 43
Appendix 2. Other relevant strategies .......................................................................................... 44 – 48
Appendix 3. Relevant EU directives ............................................................................................ 49 – 50
Appendix 4. Examples of cooperation programmes relevant for the BSR ..................................... 51
Appendix 5. The investment concept .......................................................................................... 52 – 53
The Baltic Sea Region has been officially designated on as one of the European regions of the future. The region is characterised by a strong dynamic and diversity in terms of economic development, infrastructure, institutional set-up, cultural aspects and traditions of governance. Although most of the countries in the region have to adhere to common EU rules, and in spite of good international and interregional contacts and communication, little effective cooperation or coordination has taken place to adequately address common challenges, in the area of waste management and municipal waste in particular.

With increasing economic prosperity and growing private consumption, there is an increasing amount of waste being generated. Despite good prospects for development, there are still significant economic differences and infrastructure capacities across the region. The region also lacks a common vision and a shared strategy for how to address solid waste management problems and best take advantage of international collaboration in using countries’ experiences, best practices, sharing capacities and/or infrastructures.

Part of the problem is due to the fact that there are many diverging visions and strategic priorities, which, in turn, restrict effective utilisation of regional capacities and financial resources to help them climb up the waste management hierarchy. In order to facilitate more sustainable waste management solutions, there is an apparent need for a common vision. In this context, the elaboration of a joint waste management strategy for the Baltic Sea Region is being proposed.

This strategy document is an attempt to address this need and was developed as one of the outcomes of transnational project “RECO Baltic 21 Tech – Towards Sustainable Waste Management in the Baltic Sea Region” (RB21T), which is partly funded by the EU Baltic Sea Region Programme 2007–2013.

The strategy is not intended to replace national waste management plans but act as a complement to them, providing useful input and recommendations which may help countries in implementing waste management plans.

The Strategy contains a set of recommendations for strategic action, including the needs to ensure timely compliance with the EU acquis targets and requirements by providing adequate policy and financial support to key players; create conditions for more competitive higher-hierarchy solutions by combining strict and well-enforced regulations with economic incentives and informational instruments; facilitate cross-municipal cooperation and optimise the engagement of the private sector in competitive waste management by means of tendering and public-private partnerships, among other things.

It is perceived that this strategy document provides a unique opportunity to initiate one of the first regional high-level collaboration programmes in the field of waste management in the BSR, and serves as an example of concerted regional integration to other European regions.
The Baltic Sea Region (BSR) is both dynamic and diverse in terms of economic development, infrastructure, institutional set-up, cultural aspects and traditions of governance. Although most of the countries in the region have to adhere to common EU rules, and in spite of good international and interregional contacts and communication, little effective cooperation or coordination has taken place to adequately address common challenges, including those existing in the area of waste management and municipal waste in particular.

With increasing economic prosperity and growing private consumption, there is an increasing amount of waste being generated. Despite good prospects for development, there are still significant economic differences and infrastructure capacities across the region.

The region also lacks a common vision and a shared strategy for how to address solid waste management problems and best take advantage of international collaboration in using countries’ experiences, best practices, sharing capacities and infrastructures.

Diverging visions and strategic priorities restrict effective utilisation of regional capacities and financial resources to help them climb up the waste management hierarchy. In order to facilitate more sustainable waste management solutions, a common vision and an idea for a joint strategy for the Baltic Sea Region is proposed.
The vision

The vision of the region is that by 2030 at least 50% of all waste will be prepared for material recovery in all Baltic countries, including Russia and Belarus. The region sets minimal targets of no more than 5% landfilling of mixed municipal waste, with the rest handled in waste-to-energy solutions. Countries which have already reached these targets should have much more ambitious goals and focus more on waste prevention and further depoisoning of waste streams.

Material recovery from waste is a priority, together with high-grade energy recuperation. This means that waste-to-energy solutions, if adopted, will be geared towards high-efficiency performance and utilisation of heat in district heating systems, together with electricity cogeneration. Material recovery must be facilitated, not only for waste product groups that are under the extended producer responsibility (EPR) of the industry, but also for other recyclable products and materials.

Mass incineration will be considered for mixed non-sortable municipal waste only after the economic feasibility of material recovery is exhausted. Mechanical biological treatment is a possible element of waste treatment before landfilling, or can be used as an additional, optional component before energy recovery.

The vision of the Baltic Sea Region is to become the flagship European region in sustainable municipal waste management with minimal impacts on climate change, nature and human health and without major disparity among the countries.
The strategy

The strategy is not intended to replace national waste management plans, but to act as a complementing component for regional coordination. However, attaining the vision of becoming the flagship EU region in waste management hierarchy management requires a joint regional strategy to coordinate national priorities and to take a coherent approach, maintaining the principles of precaution, subsidiarity and proximity; adhering to the concept of waste management hierarchy and taking a life-cycle perspective; and applying the same principles of waste management services to all, as well as optimal division of responsibilities among key actors.

The main recommendations for the strategic priorities of the joint waste management strategy of the Baltic Sea Region are as follows:

- Ensure timely compliance with the EU acquis targets and requirements by providing adequate policy and financial support to key players.
- Create conditions for more competitive higher-hierarchy solutions by combining strict and well-enforced regulations with economic incentives and informational instruments.
- Facilitate cross-municipal cooperation and optimise the engagement of private sector in competitive waste management by means of tendering and public-private partnerships.
- Open up the market for the best available techniques and solutions, looking for solutions throughout region so as not to invent things over and over again.
- Maintain waste management hierarchy as a key principle with a life-cycle perspective and focus on waste prevention.
- Apply known and well-tested, informative, administrative and economic policy instruments to facilitate waste diversion away from landfills.
- More strategic focus on high-quality recycling; prioritise waste separation at the source by waste generators, focus on consistent and long-term improvement in the quality of separated waste (especially biodegradable waste).
- Support the development of demand and markets for recyclable materials and compost in the region.
- Pay greater attention to public participation; engage and motivate households to source-separate; introduce mandatory sorting combined with tangible economic stimuli and develop more convenient infrastructures of higher convenience.
• Focus on building adequate waste management infrastructures for centralised treatment of waste that has been previously separated at the source.

• Prioritise the detoxification of products using eco-design approaches and detoxification of waste streams by means of organising source separation and adequate separate treatment.

• Improve the involvement of the industry (producers) by optimising and strengthening extended producer responsibility systems.

• Improve the financing of waste management schemes through local and national mechanisms; improve the absorption capacity for EU funding with the long-term goal of reducing its significance.

• Ensure that landfills treat waste before disposal and have a system for accumulating sufficient financial security to cover closure and aftercare costs.

The way forward

It is believed that the idea of producing a joint waste management strategy for the Baltic Sea Region will provide a solid basis and a productive platform for coordinating intergovernmental actions and setting national priorities at the EU level as a whole, and among BSR countries in particular.

The strategy provides a unique opportunity to initiate one of the first regional high-level collaboration programmes in the field of waste management in the BSR, and serves as an example of concerted regional integration for other European regions.

The European Commission should take steps to initiate further discussion among Member States on how this strategy should best be put into practice. Member States may wish to carefully consider the elements of this strategy and use them, either in part or in full, in support of ongoing and future waste management plans.
Increasing economic prosperity in the European Union (EU) is accompanied by higher consumption levels and, consequently, a growing amount of post-consumer waste.

Today, the EU generates about 275 million tonnes of household waste annually, which is an average of 450–500 kg/capita. OECD estimated that by 2020, the EU may be generating 45% more waste than it did in 1995. While the management of industrial waste is now in relatively better shape, the management of municipal waste appears to be much more challenging and an analysis shows diverse results among EU members.

Regulations are much more difficult to control and enforce on households compared to industrial actors. Moreover, households are using more and more hazardous products and materials, which inevitably end up in waste streams.

This creates further technical problems and increases the cost of handling waste while protecting human health and preserving the environment.

However, several countries are successful examples, both in decoupling economic growth from waste generation, and in sustainable waste management. For instance, Germany and the Netherlands reported drops in the amount of total municipal waste produced over the course of the 1990s, and several countries (e.g. Denmark, Germany and Sweden) have achieved drastic reductions in landfilling by diverting waste into recycling, biological treatment and incineration with energy recovery.

The region has undergone increasing integration with the enlargement of the EU. However, it is highly heterogeneous in terms of economic development levels, infrastructure, institutional set-up, cultural aspects and traditions of governance. Economic develop-
Baltic Sea Region (BSR) is home to nearly 100 million people living in ten countries and is unique in terms of its environment and the central position of the Baltic Sea with its fragile ecosystem.
ment and growing affluence are raising new challenges, including the deteriorating state of the Baltic Sea. There are still significant disparities in the environmental footprints of industries, infrastructures and services, including waste management systems.

A recent screening study showed the level of disparity across the region in terms of waste management performance.¹

The east-west division is apparent, with Germany, Denmark, Sweden and Finland generally scoring two and four times higher in their environmental performance ratings than Poland and the Baltic States respectively. In Russia and Belarus, the level of performance is even lower.

The introduction of common EU rules, instruments and policies have paved the way for more effective coordination of activities to deliver higher standards of living for the citizens of the region, including environmental quality. However, in spite of good international and interregional contacts and communication, little effective cooperation or coordination has yet taken place to take full advantage of the new opportunities that EU membership provides to help adequately address common challenges, including those existing in the area of waste management.

The EU is setting new goals and targets for waste recycling and waste prevention including the goal of decreasing waste generation levels by 2020.² Since the disparity in waste management standards within BSR is significant, achieving these targets requires cooperation and more coherent governmental actions within the Baltic Sea Region.

The region lacks a common vision and a shared strategy for how to address the problems of sustainable municipal waste management and best take advantage of international collaboration by using countries’ experiences and best practices, as well as sharing capacities and infrastructures. In order to facilitate higher-order waste management hierarchy solutions, a common vision and a joint strategy for the Baltic Sea region is needed.

² See Appendix 2.
The Baltic Sea region includes ten countries within the drainage area of the Baltic Sea. Looking at the main characteristics of the municipal waste management sector, the countries can be clustered into three groups.

One group – Sweden, Finland, Denmark and Germany – are old EU member states with high GDPs and established institutional set-ups. They have well-developed waste management infrastructures with very little landfilling, high rates of source separation and large shares of material recycling and energy recovery. These countries also have well-organised systems that are fairly adequately financed by mostly national (public or private) sources. However, compared to other countries in the region, these countries have a highest waste generate rate (Figure 5).

Another group – Estonia, Latvia, Lithuania and Poland – are new EU members, with GDP rates typically half the EU average and waste management infrastructures and institutions that are still developing. While the recycling rates are steadily increasing, the majority of waste is still landfilled, while the share of source-separated waste and recycling efficiency are generally low.

Waste management systems typically have shortcomings in terms of financial self-sufficiency; domes-
Public financing is usually insufficient, and the EU structural funds play a significant role. While there are still some allowances for the implementation of the EU Landfill Directive 1999/31/EC, the "two-speed Europe" approach will soon end. The general level of preparation for meeting the EU targets in Poland and the Baltic States is generally poor. There are significant challenges in terms of infrastructure modernisation, optimisation of institutional and legal set-ups, and securing adequate sustainable financing with less dependency on the EU cohesion funds.

Households play a very important role in primary sorting with additional secondary centralised sorting in the west, while in the east, recycling relies mainly on centralised sorting solutions.

There are two dominant strategies for waste treatment in the BSR.

In the western parts, a high degree of sorting in households enables high material recycling rates and more options for biological treatment. The historical development of incineration also enables significant diversion of waste away from landfills.

In the eastern parts, where source separation is weak and the share of mixed municipal waste is high, the alternatives for landfill today are seen mainly in different forms of centralised solutions, such as mechanical sorting, mechanical-biological treatment (MBT) and, increasingly, incineration.

Russia and Belarus form a group of non-EU countries with even less developed waste management systems and weak or ineffective institutional and administrative setups.

Most of the waste is landfilled and only very few landfilling sites are comparable to those acceptable according to EU standards. Separate collection and recycling rates are gradually growing, but are still very low. The situation with financing is even more critical and EU financing is largely unavailable.

The state has a dominant role in municipal budget setting and regulating tariffs for all public services (incl. waste management). The municipalities, similarly to in the other countries in the BSR, are legally responsible for organising waste management, but they are ill-equipped.

The involvement of the private sector is emerging, but is still very marginal and generally centred around the most profitable parts of waste management.

3 URL: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31999L0031:EN:NOT
THE VISION

Becoming a flagship region implies that municipal waste is managed in a sustainable way, i.e. with minimal environmental and human health impacts, a high degree of economic value recovery, the creation of new jobs and with a fair distribution of responsibilities among all relevant actors.

Sustainable waste management in the region is integrated with its vibrant economy, protecting human health, protecting the environment and improving the quality of life for people living and working in the region, now and for generations to come.

Waste management in the region is to be geared towards the top solutions in the waste management hierarchy, giving top priority to waste prevention and high-quality material recovery. The same uniform principles of waste management services are to be applied across the region.

The entire population in the region is to be included in formal and well-organised waste management services, so that all citizens equally understand and have the same roles and responsibilities in waste management.

The burden of waste management is shared between households, municipalities and industry, with clear definitions of their roles and responsibilities. Waste management is to be organised according to the ‘polluter pays’ principle, with fair involvement of all relevant stakeholders. Authorities in the region are to create sufficient prerequisites for climbing up the waste management hierarchy, and policy measures are to be implemented in a harmonised way, guided by a joint strategy for waste management.

The vision of the region is that by 2030, at least 50% of all waste will be prepared for material recovery in all countries, including Russia and Belarus (Figure 1).

The region has set a target of no more than 5% landfilling of mixed municipal waste, with the rest treated using waste-to-energy solutions. These are the minimum targets for the entire region, based on both the contemporary scientific evidence and best practices from countries throughout the BSR.

Countries in the BSR which have already reached these targets should have much more ambitious goals and focus more on waste prevention and further depoisoning of waste streams. The targets represent the optimum solution from an environmental and an economic perspective, given the experience of the contemporary policy measures, such as landfill tax, landfill bans, extended producer responsibility schemes and mandatory source separation.

The targets are based on the EU acquis targets, objectives and drivers, in particular the biodegradable waste diversion targets, the 2015 requirements for separate collection, the 2020 recycling targets (Art.
The vision of the Baltic Sea Region is to become the flagship European region in sustainable municipal waste management with minimal impacts on climate change, the environment and human health, and without major disparity among the countries.
11 of the EU Waste Framework Directive) and the targets to be established for waste prevention (Art. 9 of the EU Waste Framework Directive).

The targets are also based on both scientific evidence and contemporary best practices from countries throughout the BSR. It is believed that these targets represent the optimum solution from an environmental and an economic perspective and are achievable using well-tested measures, such as landfilling taxes and bans, mandatory source separation and extended producer responsibility schemes. (Figure 1.)

Material recovery from waste is a priority, together with high-grade energy recuperation adapted for climatic and infrastructural realities in the region and climate change mitigation. This means that waste-to-energy solutions, if adopted, will prioritise high efficiency and utilisation of heat in district heating systems, together with electricity cogeneration. Mass incineration will be considered for mixed non-sortable municipal waste only after the economic feasibility of material recovery is exhausted.

Mechanical biological treatment is an important element of waste treatment before landfilling deposition, or can be used as an additional, optional component in energy recovery solutions.

All waste management solutions will be adapted with the close collaboration and involvement of municipalities, industry and households. Material recovery must be facilitated not only for waste product groups that are under the extended producer responsibility (EPR) of the industry, but also for other recyclable products and materials.

It is the responsibility of municipalities to facilitate the collection of recyclables that are not regulated by EPR or deposit systems, particularly emphasising the importance of high-quality of source separation. To ensure effective functioning of EPR waste flow management, adequate cooperation between the industry and municipalities is an important prerequisite.

Attaining the vision of becoming the flagship EU region in waste management requires maintaining adequate priorities and coherent actions of all BSR countries, which can be facilitated by a joint waste management strategy. The strategy will not replace national waste management plans, but is a complementing component of regional coordination.

Recognising the vision of the region, waste management strategy in the BSR must adhere to the waste management hierarchy with a lifecycle perspective.
STRATEGY CORNERSTONES

Waste management in the Baltic Sea Region will be organised on the basis of five cornerstones of sound municipal waste management:

i. Polluter pays, precaution, subsidiarity and proximity
ii. Waste management hierarchy with a lifecycle perspective
iii. The same strategic approach to waste management services for all citizens
iv. Optimum division of responsibilities among key actors
v. Timely compliance with the EU acquis requirements

The precautionary principle will be applied when there is a scientifically justifiable reason for concern that considerable risks to the environment and/or human health may be involved. Maintaining this principle implies that waste is to be managed without endangering human health or harming the environment.

The principle of subsidiarity implies that, unless there is a more effective strategy, local authorities are given priority in decision-making over national authorities and the EU level decision-making, except in the areas that fall within the exclusive competence of the central authorities.

The principle of proximity implies that waste should be managed close to the point at which it is generated, with the aim of achieving responsible self-sufficiency at regional or local level, and that all decisions are taken as openly as possible, and as closely as possible to the citizen.

THE BSR STRATEGY FOR WASTE MANAGEMENT

i. Polluter pays, precaution, subsidiarity and proximity

To ensure fair distribution of financial burdens and to encourage preventative behaviour, the polluter pays principle must be the guiding rule for setting up administrative schemes for waste management. Those actors who take adequate measures to reduce waste generation should not have to cover the waste management costs of polluters. Waste management systems must be economically sustainable and not subsidised by taxpayers’ funds from other sectors.

The precautionary principle will be applied when there is a scientifically justifiable reason for concern that considerable risks to the environment and/or human health may be involved. Maintaining this principle implies that waste is to be managed without endangering human health or harming the environment.

The principle of subsidiarity implies that, unless there is a more effective strategy, local authorities are given priority in decision-making over national authorities and the EU level decision-making, except in the areas that fall within the exclusive competence of the central authorities.

The principle of proximity implies that waste should be managed close to the point at which it is generated, with the aim of achieving responsible self-sufficiency at regional or local level, and that all decisions are taken as openly as possible, and as closely as possible to the citizen.

ii. Waste management hierarchy and lifecycle perspective

The EU Framework Directive on Waste 2008/98/EC sets the basic concepts related to waste management and states that Member States’ waste legislation and policy must apply a waste management hierarchy as a guiding principle (see Annex 1).
iii. The same strategic approach to waste management for all citizens

This principle implies that all citizens are included by formal/organised waste management services regardless of their place of residence – urban or rural. All informal solutions for waste utilisation other than home composting and waste reuse by households are effectively prevented. In addition, all citizens, regardless of their place of residence, are given the same roles and responsibilities in waste management.

That is, waste-sorting duty is uniformly demanded from all households, urban and rural, so that a consistent message is communicated to all citizens. The number of household-sorted waste fractions may differ from region to region depending on economic and environmental feasibility of local waste management approaches.

iv. Optimal division of responsibilities among key actors

Responsibilities for waste management must be shared among the key actors. It is the prime responsibility of municipalities to be responsible for and to organise waste management. However, an efficient waste management system requires effective collab-
oration between national governments, local authorities, industry, businesses and society at large.

The role of national governments is to provide local authorities with the legal means and instruments to help them to exercise their responsibility and enable them to climb up the waste management hierarchy.

Without the participation of industrial actors, it is impossible to address waste prevention through product eco-design, which is the best option to prevent future problems. Based on the polluter pays principle, industry must be made responsible for the management of its waste to the highest degree possible.

This priority rests on the principles of extended producer responsibility and incentives are to be created for waste prevention and minimisation. It is also the role of all stakeholders to effectively engage households in waste sorting. Without the participation of households, it is more costly and more difficult to efficiently close material loops and climb the waste management hierarchy.

All key stakeholders must be involved in waste governance, which enables consensus building and facilitates acceptance, creates a sense of problem ownership and allows potential conflicts to be addressed, thus improving the efficiency of waste management systems.

v. Timely compliance with the EU acquis requirements

This strategy recognises that the requirements of the EU acquis frameworks are important stimuli for national governments to push development in the right direction. Therefore, compliance with the requirements of all EU directives and strategies is also a cornerstone of this strategy.
CHALLENGES AND ACTIONS OF THE STRATEGY

The following part of the strategy describes the key challenges identified in the region, prioritises key actions and identifies responsible parties within the following areas:

i. Facilitating cross-municipal cooperation

• Challenge

Countries throughout the BSR typically have a large number of small municipalities that often lack the competence, experience, technical, financial, infrastructural or human resources to exercise their waste management responsibilities to a desired degree or level of quality.

This could be compensated by cross-municipal cooperation and pooling of resources. However, in some countries (e.g. Estonia) the cooperation between municipalities is rather poor, especially when the legal framework for helping cross-municipal cooperation is insufficient.

The cooperation could take place by many means, from exchanging experiences to sharing joint capacities and infrastructures for waste management. In countries like Sweden and Lithuania, successful examples exist, where waste management is organised by a regional principle and several municipalities are forming cross-municipal structures for waste management.

This includes shared ownership of facilities, infrastructures, financial and human resources, which allow better long-term planning of regional waste management systems, as well as facilitating more efficient forms of waste management that may enable higher waste management hierarchy solutions.

• Strategy actions

National authorities must

– Seek to create an adequate legal framework to formalise forms and means of cross-municipal cooperation, including regulations on administration, asset ownership, investments, profits, responsibility allocation and accountability.

– Encourage best practice sharing and dissemination, in particular with regard to developing separate collections for recyclable materials and food waste, and in promoting demand and markets for recyclables and compost.
Households play a very important role in primary sorting with additional secondary centralised sorting in the west, while in the east, recycling relies mainly on centralised sorting solutions.
Regional authorities and municipalities should

- Engage in active dialogue with their neighbours and set goals for creating joint cross-municipal institutions to organise waste management within their joint administrative boarders.

- Organise municipal waste management to be economically sustainable schemes based on the polluter pays principle. It must be clearly acknowledged that waste management is an economic activity.

- Ensure that waste management costs are adequately transferred to polluters in proportion to the amounts and nature of the waste generated by them and these costs not covered by other sectors.

ii. Optimising private sector engagement

• Challenge

Many municipalities in the BSR are small and often have insufficient capacity to organise efficient waste management systems. If municipalities do not cooperate with each other, one option is to rely on the private sector.

However, dependency on the private sector without sufficient control may bring some undesirable consequences such as can be seen in Estonia, with little municipal cooperation and a liberal market for private waste management services, the authorities were left with little means to steer waste treatment towards more desirable solutions.

Competition among private waste companies has concentrated waste management services and directed investments largely to densely populated areas, resulting in an overcapacity of waste treatment facilities (e.g. MBT, recovery of plastic waste and incineration). This made it difficult for municipalities to achieve adequate waste management service coverage and plan for a reasonable regional waste recovery infrastructure and investments.

It put in danger the goals of meeting the recycling targets. Relying only on the private sector with little steering capacity from municipalities creates structural inefficiencies and may induce higher environmental and social costs.

• Strategy actions

Waste management systems must be developed with practical economic sustainability in mind. In other words, waste management should not become a target for regular public subsidies, but instead valorise the economic value of waste in the first place and burden the polluters with the cost of waste management. On the other hand, preventive action and participation in waste management schemes should be adequately rewarded. The engagement of the private sector in waste management has often proven to be effective in managing WASTE MANAGEMENT costs at optimum levels.
A regulatory framework must be created at a national level to facilitate transparent competition in the waste management sector. Regulations must also ensure mechanisms to protect the population from inflated waste management costs.

**National authorities** must

- See that investments are based on strategic waste management plans, including objective options analysis. Moreover, the investments should be made only with sound business plans and reasonable payback times to prevent the intergenerational shift of financial burdens.

- Ensure harmonisation of waste management administration across municipalities (set rules that are based on the same principles in all municipalities).

**Regional authorities and municipalities** should

- Seek to maintain a sufficient stake in waste management systems. The municipality has to have a hands-on approach, at least in terms of administration, including setting waste management tariffs and collecting the fees, stronger control over EPR programmes, better enforcement of regulations, and taking a more active role in awareness raising and coordination of public campaigns. This also includes closer dialogue with the private sector in defining the density of waste collection points, collection frequency and providing incentives for citizens to separate (by e.g. cross-subsidising some collection costs).

- Reach clarity and agreement with the waste management companies and EPR schemes over the standards of waste collection and the level of waste management services (cleaning up the sites, number of containers, harmonisation of container colours, types of packaging to be collected, frequency of collection, etc.).

- Create clear rules for public procurement and transparent tendering procedures for private contracts. The goal should be to achieve optimum balance between private and public shares in public-private partnerships.

- Not rely on too long-term contracts with the private sector.

- Prevent private households from making individual contracts with private waste collection services.

- Always consider environmental aspects. Private contractors must provide environmental evaluations of their services in decisions and contracts with the private sector.

**iii. Create conditions for more competitive higher hierarchy solutions**

- **Challenge**

Climbing up the waste management hierarchy requires creating adequate conditions for higher hierarchy solutions to become more competitive with the cheapest waste management approaches. To-
day, higher hierarchy solutions, such as material and biological recycling, often cannot compete with the cheaper options, such as landfilling.

There is a way for policymakers to intervene by providing the conditions for all market players to have an economic interest in the recycling of material value over other means of waste valorisation. It must be broadly recognised that waste is a resource and waste management should be economically sustainable without significant and regular subsidising.

As the experiences of BSR countries show, several well-tested policy tools exist that facilitate the climb up the waste management hierarchy, which primarily implies diverting waste away from landfilling, and promoting material recycling and waste prevention. Unfortunately, some BSR countries still lack effective interventions, such as bans, restrictions and landfilling taxes.

For instance, the level of current landfill tax is still rather low, or even missing, in some of the Baltic States, where it restricts the economic attractiveness of higher hierarchy solutions.

Restrictions on landfilling of certain waste fractions have proven an effective tool to reduce landfilling. The introduction of landfilling restrictions should consider the existence of capacities for alternative waste treatment options and be implemented gradually, in parallel with the development of alternative infrastructures.

Landfill tax is an important policy instrument practiced in nearly all EU member states. It has proved to be very effective in limiting landfilling, as there is a clear correlation between total costs and landfilling rates. This instrument is relatively easy to administer and provides a reasonable source of revenue, especially during its early implementation stages.

Similar to landfilling restrictions, the introduction of the landfill tax must be implemented in parallel with creating the conditions for other waste management options. At the same time, the distribution of the tax revenues may inhibit its effectiveness in promoting alternative waste management options. For instance, 75% of landfill tax revenue is distributed back to municipalities in Estonia, which creates a conflict of interest in promoting alternatives. Conversely, in Sweden the tax goes to the general state budget and therefore does not create the same conflict of interest. There are also other alternatives for the use of the tax revenues, such as R&D, demonstration or capacity-building.

Figure 8. The rate of landfilling (% of total amount of waste) in countries in the Baltic Sea Region versus the difference in landfill tax (source: Joint Strategy for Waste Management in the Baltic Sea Region).
• Strategy actions

National authorities must

– Ensure timely compliance with EU targets.

– Introduce landfilling restrictions and bans for certain recyclables, bio-waste and (in perspective) burnable waste as soon as recycling capacity becomes available.

– Introduce/adjust state landfill tax to a level that becomes effective in diverting more waste away from landfills, introduce a schedule and a system for its periodic revisions. To restrict extensive waste movement, the landfill tax interventions should take into consideration prices in neighbouring countries/regions.

– Make sure that landfill tax revenues are used to promote higher-order hierarchy solutions, but avoid too high a dependency on income from the landfill tax.

– Depending on local trends, consider a gradual shift of the tax burden to other treatment options for mixed municipal waste (e.g. waste fuel production and incineration), especially where MBT and mass incineration overcapacity is clearly influencing the development of source separation and recycling.

– In parallel, support the development of demand and markets for recyclable materials and compost in the region, where rules for public procurement demanding recycled/recyclable content in products, building codes and decommissioning regulations, operational regulations for public facilities and infrastructures could play an important role, for example.

– Ensure that all decisions are based on waste management plans that include sound business plans based on a best option analysis and reasonable payback times. This includes strengthening the municipalities in their work.

A condition for allocating support for modernising waste management systems from the European Union could be proof that adequate and effective policy measures have been employed to stimulate the diversion of waste away from landfills.

iv. Involve and motivate households to source separate

• Challenge

In BSR countries where waste recycling rates are low, one of the most important underlying problems is source separation due to uninvolved and unmotivated households. The participation of the public in waste management schemes is the cornerstone for climbing up the waste management hierarchy. Involving the public requires time, money, effort and concerted long-term planning.

Unfortunately, awareness-raising activities are often deprioritised in favour of technical solutions and in-
frastructural investments. Efforts to involve the public also often fail to address other important elements, such as adequate incentives and a convenient infrastructure for waste sorting.

Finding it difficult or ineffective to try to engage households, many waste management systems tend to rely on centralised sorting solutions and related treatment approaches such as mechanical-biological treatment of poorly sorted (mixed) waste.

Such solutions do not deliver the full potential of environmental savings and have poor economic performance due to low quality of recycled materials and high sorting costs.

**Strategy actions**

The perception that centralised waste sorting can facilitate recycling without the involvement of households must be changed.

National authorities must

– Aim to consolidate the differences in waste tariff systems and financially support more pilot sorting projects and put emphasis on the dissemination of results.

– Support best practice sharing and dissemination, in particular with regard to promoting separate collection of recyclable materials and food waste.

Regional authorities and municipalities should prioritise finding the best set of stimuli to effectively engage households. Ideally, both primary and centralised waste sorting steps should exist in parallel. Municipalities should clearly explain the benefits of waste sorting, especially the importance of clean separation, as well as keeping the population well-informed of their achievements. It is important to introduce a fairer waste tariff system linked to actual household behaviour (waste generation rate and/or sorting activities).

Two sets of action are needed:

1. Make raising public awareness a consistent long-term activity targeting the public, politicians, business and industry to ensure better cooperation with the private sector. For the engagement of households, these main conditions are necessary:

   – Make the public aware of the environmental benefits and process of sorting.

   – Sorting should be made comfortable and accessible using a high density of municipal collection points.
Short descriptions of pilot projects

Make the public aware of the environmental benefits and process of sorting.
– Incentives must be created through waste collection fees (e.g. no flat rate fees, more effective ‘pay as you throw’ schemes; differentiated waste management tariffs).

– Control and enforcement of non-compliance must be effective.

– Raising awareness and disseminating information must be made long-term and consistent practices.

– Cooperate with producer responsibility organizations in awareness raising activities.

2. Introduce mandatory separate collection systems for specific waste streams that are not covered by extended producer responsibility schemes. This is especially relevant for biowaste (kitchen waste), hazardous household chemicals and other products containing hazardous materials, e.g. batteries, electronics, etc. Regional authorities and municipalities should:

– Prioritise and expand mandatory source separation of paper and biowaste (kitchen and garden waste) in the first place.

– Create a system for the separate collection of hazardous household wastes.

– Introduce penalties for non-compliance of waste management companies and households.

– In addition to the container network, expand the network of civic amenity-based separate collection sites.

– In parallel, develop central post-sorting facilities.

v. Reduce the share of bio-degradable waste going to landfills

● Challenge

Sweden, Denmark, Finland and Germany are expanding separate collection systems from households and investing heavily into biological treatment methods. In some countries, biogas production is developing particularly rapidly. Here, the main stimuli are national strategies and municipal policies on climate change, energy security and transport.

On the other hand, in many of the other countries, 80–90% of biowaste\(^5\) still ends up in landfills.

Once in the landfills, biowaste is a major source of greenhouse gases, such as methane, which is more than twenty times more potent than carbon dioxide.

\(^5\)Biowaste is biodegradable garden/park waste and kitchen waste from households, restaurants, caterers, retailers, and similar waste from food processing plants. It excludes forestry or agricultural residues, manure, sewage sludge, natural textiles, paper and processed wood.
Alternative treatment methods such as composting and anaerobic digestion are gradually emerging, but they are still only used at a rather marginal level.

The main problem is virtually non-existent separate collection from the households and underdeveloped infrastructure for anaerobic treatment and composting. In addition, due to insufficient sorting quality and no uniform criteria for compost, the demand for compost is low and, in effect, it is not really used to replace artificial fertilisers.

The potential of biogas to replace fossil fuels is also highly underutilised, which, in light of the high energy dependency of the Baltic States and the high prices of natural gas, represents a great opportunity. Both municipalities and households are reluctant to engage in separate collection on sanitary or hygienic grounds.

There is also a prevailing opinion that quantities of biowaste are too small for economically feasible production scales.

• Opportunities

Source separation and treatment of biowaste (composting and anaerobic digestion) allow the production of energy (biogas) and fertiliser (compost or digestate), which bring environmental savings if they substitutes synthetic fertilisers or fossil fuel based energy. However, both the environmental and economic gains of biotreatment can be achieved only if separation of biowaste is organised early in the waste management chain and as close to households as possible.

Household engagement in high-grade source separation is crucial to ensure high quality of raw material that is free from hazardous materials and toxic substances, which, in turn, opens up more options for further treatment and better economic possibilities for its valorisation.

Keeping the toxic and hazardous waste fractions away from the biodegradable waste stream helps with the production of good-quality compost with a higher market value, aids the efficiency of anaerobic digestion systems and allows for a greater use of biosludge. Experiences in the Nordic countries now demonstrate that even small amounts of source-separated kitchen waste can be treated economically feasibly when it is treated in combination with agricultural waste. Agriculture is an important sector in the Eastern BSR and represents a good opportunity for combining its waste with the management of biowaste originating from municipal waste.

The experiences of Nordic countries also show that the precondition for better valorisation of compost is clear standards and regulations on a national and regional level, with adequate quality control and marketing support.
• **Strategy actions**

Mixed municipal solid waste as an input for composting and anaerobic digestion should generally be avoided. It is usually difficult to ensure a uniform high quality of this material (compost like material) produced from mixed municipal waste, and it may contain hazardous substances from the mixed waste streams, which results in low market demand and limited prospects for further economic use.

MBT must be regarded as a temporary solution for mixed municipal waste before a more advanced sorting and recycling infrastructure is developed. While the waste management hierarchy also applies to the management of biowaste, in specific cases, it may depart from it as the environmental effects of different waste management options depend on local factors, such as the collection system, waste composition, climate and the potential of use of various waste-derived energy or material products.

Local strategies for biowaste management should be determined in a transparent manner and be based on life-cycle thinking. The European Commission has prepared a set of guidelines for planning the management of biowaste.¹

**National authorities must**

– Raise more awareness about the use of compost and better involve farmers.

– Specify common rules, quality criteria and control schemes for compost.

– Allow composting and anaerobic digestion only of source-separated biowaste.


- Create support schemes for compost producers: consider lower VAT on compost and/or use public procurement for compost material to stimulate its use.

- Support investment in anaerobic digestion plants for source-separated biowaste treatment; incorporate the management of agricultural waste into these facilities.

Regional authorities and municipalities should

- Look for opportunities to cross-subsidise free bins/bags for the separate collection of biowaste and/or other separately collected waste fractions.

- Establish convenient collection points for kitchen waste near homes and for garden waste at civic amenity sites with manned supervision.

- Provide manuals and guidelines for home composting and facilitate the use of compost in public campaigns.

vi. Improve sorting quality and depoison waste streams

• Challenge

A high quality of waste sorting is as important as having high rates of source separation. Material purity is crucial for the quality and price of the recycled materials. Even small amounts of impurities can seriously affect both the recyclability and the rest value of secondary materials (e.g. porcelain in glass, coloured glass in clear glass, toxics in compost, etc.). Unfortunately, the variety of materials on the market (e.g. plastics), a growing share of composite packaging and the increasing complexity of products in general make high-quality waste separation a challenging task for households.

Another generic problem is that households today are using more and more products containing substances which are dangerous to the environment or human health. These substances are entering waste streams in poorly organised waste collection systems. Old medicine, paints, thinners, cleaning agents, batteries and similar can compromise the recyclability or safe management of waste even if they only appear in small amounts. This problem is persistent across the entire BSR.

Waste containing hazardous products and toxic substances must be separated as early as possible to avoid mixing with other waste fractions. This is especially relevant for composting.

However, today countries of the eastern BSR generally do not have adequate infrastructure for effective separate collection of hazardous materials and the sparsely located centralised collection points at civic amenities collect only marginal quantities.
• Strategy actions

National authorities must

– Restrict the use of hazardous products and substances.

– Strengthen requirements producers to guide the public in waste sorting.

– Improve the system of monitoring and control; enforce regulations and introduce more severe sanctions for non-compliance.

Regional authorities and municipalities should

– Better explain the importance of high-quality sorting for households.

– Provide facilities close to households for convenient separation of hazardous household chemicals with clear instructions and regular reminders.

– Equip civic amenity sites with a proper infrastructure for the separate collection of household chemicals and other hazardous products.

– Make sure that staff are always available at these sites and that they provide proper instructions to citizens.

vii. Strengthening extended producer responsibility systems

• Challenge

A significant potential to aid sustainable waste management exists in regulations based on extended producer responsibility (EPR). Although most of the countries in the BSR have implemented EPR-based waste legislation, the implementation of EPR programmes differs across the region.

In western BSR countries, the waste management industry sets the material fees of EPR products and administers the EPR programmes. The funds generated are, in principle, adequate to cover basic waste management costs. The way the material fees are set may result in improved product design, optimised for the post-consumer stage and material choices contributing to waste minimisation.

EPR programmes are sufficiently transparent and authorities have little role in the administration of EPR programmes other than controlling the implementation of producer obligations.

In eastern BSR countries, EPR schemes lack transparency and are poorly controlled and enforced. This leads to a black market of EPR waste certificates (e.g. in Lithuania) or to packaging waste collection fo-
cusing mainly on retailers and industrial users, since collecting consumer packaging is more costly. Until recently, legislation created options for the industry to pay centrally administered fees (e.g. packaging waste tariffs in Lithuania prior to January 2013), which created unnecessary complexity and several administrative inefficiencies.

Inadequate frequency of revisions of material fees, poor enforcement and many opportunities for freeriding created large discrepancies in EPR revenues and actual waste management costs.

In addition, a universal problem for the entire BSR is a lack of consensus on the division of responsibilities and the level of financing between the EPR industry and municipalities. In the western BSR, material fees in the EPR schemes are too low for municipalities’ ambitions in waste management service levels. In the eastern BSR, EPR organisations often poorly represent the interests of producers and run waste management as a pure business activity focusing primarily on retailers and industrial users to fulfil EPR obligations, whilst under-prioritising collection from private consumers, which is more costly.

• **Strategy actions**

The functioning of EPR should be strengthened by better control over the implementation of EPR legislation, reducing the level of governmental administration and its role in setting EPR fees, and by facilitating more effective dialogue between the key stakeholders in defining their roles and responsibilities.

**National authorities, regional authorities and municipalities must**

- Ensure timely compliance with the EU acquis targets.

Figure 10. Unwanted hazardous waste
- Improve the cost-effectiveness, supervision and transparency of EPR schemes and enforce the requirements of the system in place.

- Retire centrally administered governmental systems for packaging.

- Transfer the responsibility for rate setting, fee collection and administration to the producers.

- Improve the quality of statistics and waste accounting.

viii. Improving financial schemes

• Challenge

Ideally, waste management should be financially self-sufficient and not require cross-subsidising from municipal or national budgets. Unfortunately, this is often not the case in several BSR countries.

The rates of waste management fees vary greatly across the BSR with up to 5-10 factor difference in what households pay for waste management services across the region. Although waste management fees require less than 1-2% of household income in all countries, households in the eastern BSR remain highly price-sensitive to waste management tariffs. The fees are generally too low for adequate investment into waste management systems without governmental support or the European Cohesion funds.

This makes the municipalities increasingly dependent on European support schemes, which in turn require co-financing. The financial capacity of municipalities for borrowing from commercial banks is often limited (especially that of small municipalities or those that have already invested into large infrastructures). This limits the size of investments, making it difficult to build large-size facilities and benefit from economies of scale.

Another problem is that the available EU financing is used without proper planning and coordination, which can result in an overcapacity of waste management facilities. There is often too much focus on organising the investment process itself (getting access to funding), with relatively little attention paid to operational costs and or taking a long-term perspective on future trends in waste generation levels, waste composition, recycling targets and other future EU legislation promoting higher-order hierarchy solutions.

Taking a short-term perspective on municipal planning and having a poor understanding of tomorrow’s realities limit waste management possibilities in the future.
Many municipalities lack a sufficient analytical basis for decision making, which sometimes leads to environmentally and economically suboptimal decisions concerning long-term investments. Taking a short-term perspective on municipal planning and having a poor understanding of tomorrow’s realities limit waste management possibilities in the future.

Currently, many municipal waste management plans are made on an ad hoc basis in order to address the most urgent problems. Investments guided by short-term visions could be effective in addressing today’s problem, but fail in securing further improvement opportunities for the future. Investments into certain waste management options may imply long-term financial and infrastructural commitment leading to lock-in situations.

**Strategy actions**

National authorities must

- Improve their administrative absorption capacity for EU funding.

- Demand that any larger investments be based on strategic waste management plans in line with the EU Waste Framework Directive, including an objective analysis of all available options and adequate payback times, preventing an intergenerational shift of financial burdens.

- Provide dedicated funding lines for R&D in academic institutions.

- Coordinate the use of European funds between municipalities to avoid overcapacity in waste management infrastructures.

- Create policy mechanisms encouraging/facilitating the establishment of regional cross-municipal organisations for waste management and organise waste management using the regions principle.

- Facilitate cross-border system solutions for sharing waste management infrastructures while preserving municipality-specific administrative systems.

- Base financial decisions on long-term planning of future scenarios that take into consideration regional and global trends.

- Improve cooperation with research institutions in conducting feasibility studies and designing business plans.

Regional authorities and municipalities could seek guidance in the investment concept developed by the project RECO Baltic 21 Tech.  

7 REFERENCE, Briefly described in Appendix 5
4. GENERAL RECOMMENDATIONS

i. More focus on waste prevention and EU targets

Waste prevention is often the cheapest method of waste management and it must be the highest priority in BSR waste management and considered in all decision-making processes.

Addressing it requires an integrated approach that stretches beyond the boundaries of waste management systems and engages a much broader spectrum of actors along the life cycle chains of products.

How much waste will be generated and how it could be managed is decided as early as the product design stage, where decisions about product durability and material composition are made. Some of the policy initiatives at the European level, such as regulations on extended producer responsibility and restrictions on the use of hazardous substances, have proven to be successful in waste prevention, especially in reducing packaging waste and addressing the toxicity and the general hazard level of e-waste.

Product manufacturers could address waste prevention by designing products with extended lifetimes, applying modular designs, designing for reuse and remanufacturing, material substitutability, etc.

• Strategy actions

National and Regional authorities and municipalities

– All waste management plans should include a focus on waste prevention and programmes in line with the EU Waste Framework Directive.

– Set meaningful waste prevention targets and specify what constitutes prevention.

– Specify measures and guidelines that will help to achieve the waste prevention targets laid out in the Directive.

ii. Change the perception of landfilling

The perception of landfills as the end destination of waste should be changed. There is much more that landfill sites can offer today, aside from safe waste storage. Several countries in the region already have significant waste sorting and recycling activities on landfill sites.

Mechanised sorting, landfill gas recovery, composting and MBT facilities for resource recovery are among such examples.
Landfilling representing a high environmental burden, as well as a severe economic loss, should be avoided as far it is feasible. Landfilling must remain only as the end option for products and materials that cannot be sorted and recovered or treated differently, such as tiles, porcelain and crushed concrete.
Special storage cells must be prepared for the safe storage of hazardous or toxic materials, for when safe processing and material recovery become possible due to the appropriate technologies becoming available in the future.

However, even landfilled waste must be still targeted as a resource through, for example, the collection of landfill gas, which could be used as an important source of energy for local needs. In some cases, after upgrading, the gas could be feasibly fed into district natural gas networks or be used for local small-scale electricity production.

iii. Addressing urgent problems with intermediate solutions

A number of horizontal challenges for waste management in the BSR have been identified. In the eastern BSR the municipalities often do not have enough time for adequate strategic analysis of the current waste management situation or development alternatives and the available EU funds are often absorbed in an ad hoc manner, often in competition with the other municipalities.

In addition, modernisation projects are sometimes initiated on the basis of the availability of a certain funding scheme, rather than a long-term strategy.

The specifics of the EU funding schemes and the regulations of national agencies make funds for certain projects (in terms of size or technical complexity) more accessible than those required for more adequate solutions. As a result, in some countries, there is an overcapacity of landfills, especially from a long-term perspective, with the prospect of more waste to be diverted from landfills.

In certain cases, several municipalities did little to comply with the EU waste targets and, in fear of rapidly approaching sanctions, they resolved to patchwork solutions with little environmental or economic benefit.

For example, many municipalities in Poland and the Baltic States have not improved source separation by households and the approaching bans on landfilling untreated waste have pushed them to invest in mechanical-biological treatment (MBT) as a temporary solution for treating unsorted household waste to comply with toughening EU landfilling regulations.
The effectiveness of MBT for material recovery is low, as the fraction of extracted materials is relatively small and the quality is poor. The “biological” component of MBT is negligible and, at best, the solution produces refuse-derived fuel (RDF) for cement kilns or simply enters the landfills as treated waste.

There seems to be a low level of learning from the experience of neighbouring countries. For instance, MBT applications in Sweden showed a low level of economic feasibility and had some negative impacts on household waste separation.

The extracted materials were of low quality (mixed and dirty) and difficult to recycle, and the recycled materials had a fairly low economic value. Similar experiences are today observed in Estonia, with a low quality of RDF and the remaining residual fraction containing a significant amount of harmful substances, making it difficult to produce compost and requiring special landfilling.

On the other hand, in Germany, MBT is a feasible solution for treating already pre-sorted municipal waste, where the composition of the remaining mixed waste allows profitable post-sorting and the production of compost.

Therefore, MBT could be regarded as a feasible temporary solution for the Baltic States and Poland to comply with landfilling directives while building the recycling infrastructure and improving primary sorting in parallel. MBT could be a long-term solution provided that there is a significant improvement in primary sorting by households.

**iv. Addressing technology lock-in**

Investments in large waste management facilities require the maintenance of capital costs and long depreciation periods, resulting in long-lasting financial liabilities that restrict future economic choices. This may also lead to higher-than-necessary waste management costs. In some regions, both the municipalities and private actors have already made sizeable investments into modern landfills, MBT facilities and incinerators.

Facility operators are interested in maximising operational revenues to repay loans and often keep the gate fees artificially low. Without sufficient policy intervention from the national government, this is a barrier for higher-order waste management hierarchy solutions.
Overall, decisions on investments into large-scale expensive facilities like incinerators should be made with caution. Incinerators face the prospect of increasingly stringent emissions standards with which they have to comply, meaning additional investments in the future. Incineration, in principle, competes for raw materials with recycling schemes.

Increasing recycling targets may threaten the availability of input materials in general (and materials with high calorific value in particular) as more waste is to be diverted to recycling.

However, the region (especially the Baltic States) has both a significant need and good prerequisites for energy valorisation of waste. Climatic conditions, well-developed district heating networks, high prices set by energy carriers and a high dependence on one energy provider makes waste incineration with energy recovery an attractive solution.

The large-scale facilities (e.g. mass incinerators) must be strategically placed and appropriate infrastructure considered to facilitate better cooperation between waste operators in sharing existing capacities. This addresses the risk of overcapacity and enables optimisation of waste management systems.

This is where a critical role comes in for strategic waste management plans in line with the EU Waste Framework Directive and based on solid and objective analysis of all available options. Any larger investments, and especially long-term investments, must be based on these strategic plans.

Public acceptance is a critical parameter to consider. The importance of informing and educating the public and its involvement in the transparent decision-making process should not be underestimated.
5. KEY MESSAGES

The main focus areas of the strategy concentrate on four points:

• Strengthening municipal capacities in waste management.
• More effective policy intervention to facilitate climbing up the waste management hierarchy with better control and enforcement.
• More involvement of households in waste management systems, in particular in source separation of waste, waste prevention and depositing waste streams.
• Waste management systems built on shared and clear responsibilities between industry, municipalities and households.

Based on these focus areas, the main recommendations for the strategic priorities of the joint waste management strategy of the Baltic Sea Region are:

– Ensure timely compliance with the EU acquis targets and requirements by providing adequate policy and financial support to key players.

– Maintain waste management hierarchy as a key principle, taking a life-cycle perspective, focus on waste prevention.

– Facilitate cross-municipal cooperation and optimise the engagement of the private sector in competitive waste management by means of tendering and public-private partnerships.

– Open up the market for the best available techniques and solutions, looking for solutions throughout the so as not to invent things over and over again.

– Create conditions for more competitive higher hierarchy solutions by combining strict and well-enforced regulations with economic incentives and informational instruments.

– Apply known and well-tested informative, administrative and economic policy instruments to facilitate waste diversion away from landfills.

– More strategic focus on high-quality recycling; prioritise waste separation at the source by waste generators, focus on consistent and long-term im-
6. FUTURE STEPS

It is believed that the idea of producing a joint waste management strategy for the Baltic Sea Region will provide a solid basis and a productive platform for coordinating intergovernmental actions and setting national priorities at the EU level as a whole, and among BSR countries in particular.

The European Commission should take crucial steps to initiate further discussion among Member States on how this strategy should best be put into practice. Member States may wish to carefully consider the elements of this strategy, and use them, either in part or in full, in support of ongoing and future waste management plans.

- Support the development of demand and markets for recyclable materials and compost in the region.
- Pay greater attention to public participation; engage and motivate households to source separate; introduce mandatory sorting combined with higher convenience and tangible economic stimuli.
- Focus on building adequate waste management infrastructures for treating waste that has been previously separated at the source.
- Prioritise the detoxification of products by eco-design and detoxification of waste streams by means of organising source separation and adequate separate treatment.
- Improve the involvement of industry (producers) by optimising and strengthening extended producer responsibility systems.
- Improve the financing of waste management schemes through local and national mechanisms; improve the absorption capacity for EU funding with the long-term goal of reducing its significance.
- Ensure that landfills treat waste before disposal and have a system for accumulating sufficient financial security to cover closure and after-care costs.

Improvement of separated waste quality (especially biodegradable waste).

Improvement of separated waste quality (especially biodegradable waste).
The strategy provides a unique opportunity to initiate one of the first regional high-level collaboration programmes in the field of waste management in the BSR, and serves as an example of concerted regional integration for other European regions.

The work behind the strategy

This document was developed as one of the outcomes of the cross-regional project “RECO Baltic 21 Tech – Towards Sustainable Waste Management in the Baltic Sea Region” (RB21T), which is partly funded by the EU Baltic Sea Region Programme 2007–2013 promoting regional development through transnational cooperation.

The project focuses on fostering sustainable municipal waste management in the region by strengthening the capacity of Baltic Sea countries to climb the waste management hierarchy and meet the various EU directives.

The focus on municipal waste is prioritised, given the relative progress in the management of industrial waste and realising that, at the moment, it is the most challenging to improve.

RB21T is also expected to create innovative business opportunities in the cleantech industry. Operationally, RB21T has established a transnational and cross-sectoral platform for expertise exchange in waste management in the Baltic Sea Region, which will increase its competitiveness.

The challenges found have been verified by the pilot projects carried out as a part of the project, as well as by other sources. The actions suggested were developed jointly with project partners, other projects, the Baltic Waste Management Council, CBSS Baltic 21 Expert group etc. Interaction has also been taken place with other organisations such as HELCOM, EEA and ESPON.

8 The Baltic Waste Management Council is an initiative of the project RECO Baltic 21 Tech. The major aim of the council is to give officials from ministries, environmental protection agencies and authorities an opportunity to meet and discuss waste-related issues on a Baltic Sea level. The members of the WASTE MANAGEMENT are listed in Appendix 6.
APPENDIX 1. WASTE MANAGEMENT HIERARCHY

WASTE PREVENTION –
preventing and reducing waste generation – is closely linked to improving product design manufacturing methods (e.g. prolonging product life, lightweight design), influencing green consumer demand and reducing packaging. Waste prevention is addressed in the EU Thematic Strategy on the prevention and recycling of waste.⁹ (see figure 7.)

REUSE AND PREPARATION FOR REUSE –
implies giving the products a second life before they become waste, thus prolonging products’ lifetimes and avoiding new products being put on the market.

MATERIAL RECYCLING –
any recovery operation by which waste materials are reprocessed into products, materials or substances, whether for the original or other purposes. It includes composting but excludes incineration. Recycling materials allows avoiding the use of virgin materials and implies reduced environmental impacts.

ENERGY RECOVERY –
incineration with the extraction and use of material energy (waste-to-energy, WtE). Energy recovery can include the recovery of heat and/or the production of electricity. This option allows the recovery of the chemical energy built in to products when material recovery is not economically feasible or technically possible. However, it should be used only with sound technologies for emission reduction.

SAFE DISPOSAL –
is the processes to dispose of waste with minimal environmental impact. It can include landfilling, storage or thermal utilisation without energy recovery. It should be used only in cases where the options for other, higher-order solutions have been exhausted.

Today, landfilling is the prevailing solution which must be carried out using technologies that ensure minimal adverse effects to environment and human health. Current technologies include proper bottom lining for leachate isolation, leachate treatment, and systems for landfill gas extraction and utilisation.

APPENDIX 2. OTHER RELEVANT STRATEGIES

WASTE PREVENTION –

The EU strategy for the Baltic Sea Region (EUSBSR) was initiated in June 2009 by the European Parliament and adopted by the European Council in October 2009. The strategy aims to address three main issues: sustainable environment, prosperity, accessibility and attractiveness, including safety and security. The strategy’s main focus is on connecting the region through more regional cooperation to serve as a model for the whole EU.

The strategy is coordinated by the European Commission (DG Regional Policy, Territorial Cooperation) and financed by different EU funds including the Baltic Sea Region Programme and other resources may be available through cooperation with institutions such as the Nordic Investment Bank (NIB) and European Investment Bank (EIB).

EUSBSR is relevant for municipal waste management in the region by providing a horizontal framework for cross-regional alignment of national initiatives and coordination of priorities in funding R&D projects in transportation, agricultural, industrial and environmental policies. Several activities are being initiated for joining funding resources, creating closer stakeholder partnerships, maintaining closer links with neighbouring countries and establishing joint curricula in universities.

THE EU STRATEGY FOR SUSTAINABLE DEVELOPMENT

This strategy, which complements the Lisbon Strategy and was first communicated in 2001 (COM(2001)264) and updated in 2005 (COM(2005)658) and 2009 (COM(2009)400), provides an EU-wide policy framework to deliver sustainable development. Its four pillars – economic, social, environmental and global governance – reinforce each other.

The strategy states that prior to drafting and adopting any policy, its economic, social and environmental consequences need to be examined in a coordinated manner and taken into account.

The EU also assumes its international responsibilities for sustainable development, which include broader aspects such as democracy, peace, security and liberty – all to be promoted beyond EU borders.

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11 A list of current funding programmes is provided in Appendix X.
The strategy is built to address the main challenges identified, as well as cross-cutting measures, adequate funding, the involvement of all stakeholders and effective policy implementation and follow-up. The strategy is based on the several guiding principles, such as the protection of fundamental human rights; inter- and intragenerational solidarity; open and democratic society with the involvement of citizens, businesses and social partners; policy coherence and governance; policy integration; use of best available knowledge; the precautionary principle and the polluter-pays principle.

The strategy identifies seven unsustainable trends and lists a range of operational and numerical targets with specific measures at EU level to attain these objectives. Among the priority areas of focus are: climate change, transport, sustainable production and consumption, sustainable management of natural resources, public health, social exclusion and poverty within and outside the EU.

Among the main cross-cutting measures, the strategy foresees three main clusters of actions: the development of knowledge society (i.e. education and training activities); priority to financial and economic instruments (i.e. focus on greening the market and consumer behaviour, belief that prices should reflect external social costs of goods and services, and that financial support from the EU must be coordinated between the Commission and Member States), and better communication to involve businesses and the public.

THE EU ROADMAP TO A RESOURCE-EFFICIENT EUROPE

The EU Roadmap to a Resource-Efficient Europe is one of the flagship EU initiatives for addressing European resource efficiency. It was formulated as part of the Europe 2020 Strategy and is oriented towards achieving sustainable growth by shifting towards a more resource-efficient and lower-carbon economy.

Increasing resource efficiency is a key to securing growth and jobs for Europe, bringing new economic opportunities, improving productivity, reducing costs and boosting competitiveness.

The roadmap provides a long-term framework for actions in several areas, supporting policy agendas for
climate change and energy, transport, industry and raw materials, agriculture and fisheries, biodiversity and regional development-related issues. This is to increase certainty for investment and innovation and to ensure that all relevant policies factor in resource efficiency in a balanced manner.

The two horizontal strategies of the European Union provide important framework for organising national and regional strategies and organising priority actions.

At the same time, such strategies are not detailed enough to address problem areas on a sector level, such as municipal waste management. In 2012, the European Court of Auditors conducted a study evaluating the success of EU member states in climbing up the waste management hierarchy, for which the EU funding has been spent.13

Although some improvements were observed, their effectiveness is hampered by the poor implementation of supporting measures, such as waste collection strategies, and an insufficient level of funding to complete projects.

The effectiveness of EU funding was not maximised due to the weak implementation of supporting informative, administrative and economic measures, as these were not among the conditions for receiving an EU grant.

13 URL: http://eca.europa.eu/portal/pls/portal/docs/1/20156748.PDF
THE EU EASTERN PARTNERSHIP PROGRAMME

European Union initiatives, such as the EU Eastern Partnership, are important for collaboration activities with the non-EU member states in the Baltic Sea Region.

The partnership focuses on promoting democracy and good governance, strengthening energy security, promoting sector reform and environmental protection, encouraging people-to-people contacts, supporting economic and social development and offering additional funding for projects to reduce socio-economic imbalances and increase stability.

Several flagship initiatives of the partnership programme are relevant to the priorities of the joint waste management strategy of the region.

For instance, the objectives of the flagship initiative to promote good environmental governance include promoting the availability of reliable environmental information, stakeholder awareness and avoiding unintentional negative impacts in other policy sectors.

Its main activities are the development of a shared environmental information system and strengthening of capacities to ensure stakeholder involvement, and environmental assessments and reporting on the basis of EU experience and legislation and in line with relevant environment agreements, such as the Aarhus and Espoo Conventions.

Another flagship initiative is on the prevention of, preparedness for and response to natural and man-made disasters.

Its main outcomes include: better knowledge of risk exposure and available resources for enhanced preparedness and response capacities in the region; enhanced legislative, administrative and operational civil protection capacities of the partner countries; improved information, awareness and participation of stakeholders regarding disaster prevention, prevention and response.

HELCOM’S BALTIC SEA ACTION PLAN (BSAP)

The HELCOM Baltic Sea Action Plan has the aim of restoring the good ecological status of the Baltic marine environment by 2021.

The strategy, adopted in 2007, provides a framework for wider and more efficient actions to combat the continuing deterioration of the marine environment resulting from human activities.

Its main environmental priorities focus on combating the continuing eutrophication, reducing the input of hazardous substances, enhancing maritime safety and accident response, and halting habitat destruction and the ongoing decline in biodiversity.

The action plan is based on a clear set of ‘ecological objectives’ defined to reflect a jointly agreed vision of ‘a healthy marine environment, with diverse biological components functioning in balance, resulting in a good ecological status and supporting a wide range of sustainable human activities’.

The objectives include clear water, an end to excessive algal blooms, and viable populations of species and targets are based on the best available scientific knowledge. The plan is cross-sectoral and identifies specific actions needed to achieve agreed targets within a given timeframe concerning the main environmental priorities.

The action plan also distinguishes between measures that can be implemented at regional or national level, and measures that can only be implemented at EU level or globally.

The HELCOM Baltic Sea Action Plan has a strong relevance to the joint waste management strategy in terms of its programmes targeting hazardous substances: definitions, identification of sources, bans and restrictions on use and disposal, alternatives for substitution, guidance documents, capacity building and awareness raising.
APPENDIX 3. RELEVANT EU DIRECTIVES

THE WASTE FRAMEWORK DIRECTIVE (2008/98/EC) –

Emphasises the importance of waste minimisation, the protection of the environment and human health as priorities, and advocates the waste management hierarchy. All subsequent policy and legislation is aligned to the principles of the waste management hierarchy: reducing, reusing and recycling waste before seeking means to recover energy, then disposal of the residues.

– Banning the co-disposal of hazardous wastes with non-hazardous material from 2004, and requiring the reclassification of all landfills to receive hazardous, non-hazardous or inert waste only.
– Banning the disposal of whole tyres from 2003 and shredded tyres from 2006.
– Banning the landfilling of liquid wastes and certain hazardous materials (such as certain clinical waste).
– Requiring the pretreatment of certain wastes prior to landfilling.

THE DIRECTIVE ON INDUSTRIAL EMISSIONS 2010/75/EU (IED) –

Identifies specific industrial and agricultural activities (including large-scale waste management installations) and defines standards that must be achieved including control of emissions into air, land and water, energy efficiency and waste minimisation, based on the employment of best available techniques (BAT).


Requires that collection systems are put in place to enable the recovery of waste electrical and electronic equipment. Also restricts the use of hazardous substances in such equipment and promotes improved eco-design.

THE LANDFILL DIRECTIVE (99/31/EC) –

Aims to prevent the negative impacts of landfill through five key measures:

– Reducing the proportion of biodegradable waste landfilled to 75% of the 1995 amount by 2010, to 50% by 2013 and to 35% by 2020.

– Banning the co-disposal of hazardous wastes with non-hazardous material from 2004, and requiring the reclassification of all landfills to receive hazardous, non-hazardous or inert waste only.

THE LANDFILL DIRECTIVE (99/31/EC) –

– Banning the disposal of whole tyres from 2003 and shredded tyres from 2006.
– Banning the landfilling of liquid wastes and certain hazardous materials (such as certain clinical waste).
– Requiring the pretreatment of certain wastes prior to landfilling.
THE PACKAGING AND PACKAGING WASTE DIRECTIVE (94/62/EC) –

Lays down essential requirements for the composition and design of packaging and sets specific targets for the recycling/recovery of waste packaging.

DIRECTIVE ON THE INCINERATION OF WASTE (2000/76/EC) –

Sets strict technical requirements and emissions limits for incineration and co-incineration plants.

BATTERIES DIRECTIVE –

Aims at minimising the negative environmental impacts of batteries and accumulators and also harmonising the requirements of the internal market. It introduces measures to prohibit the marketing of batteries containing hazardous substances and contains measures for establishing schemes aiming at a high level of collection and recycling of batteries, with quantified collection and recycling targets.

It applies to all batteries (except equipment connected with the protection of Member States’ essential security interests and equipment designed to be sent into space) and sets out minimum rules for producer responsibility and provisions with regard to labelling of batteries and their removability from equipment.

BIOWASTE REGULATION –

Although there have been discussions about the need for a biowaste directive, currently, the management of biowaste is regulated only by the provisions of the Landfill Directive (1999/31/EC), obliging Member States to reduce the amount of biodegradable municipal waste that they landfill to 35% of 1995 levels by 2016 (for some countries by 2020).

The Landfill Directive does not proscribe specific treatment options for the diverted waste either. Nevertheless, there are several European Commission communications providing guidance on decision making for treatment options, including the use of lifecycle thinking.

The general framework for the management of biowaste, including protection of the environment and human health during waste treatment and priority for waste recycling, is laid down in the revised Waste Framework Directive, which also contains specific biowaste related elements (new recycling targets for household waste, which can include biowaste) and a mechanism allowing setting quality criteria for compost (end-of-waste criteria).
APPENDIX 4. EXAMPLES OF COOPERATION PROGRAMMES RELEVANT FOR THE BSR

European territorial cooperation programmes – transnational programmes:

Baltic Sea Region Programme 2007–2013
www.eu.baltic.net

European territorial cooperation programmes – transborder cooperation programmes:

Central Baltic INTERREG IV A Programme 2007–2013
www.centralbaltic.eu
Latvia-Lithuania 2007–2013
www.latlit.eu
Estonia-Latvia 2007–2013
www.estlat.eu
Lithuania-Poland 2007–2013
www.lietuva-polska.eu
South Baltic 2007–2013
http://en.southbaltic.eu
North 2007–2013
www.bcl.lst.se
Botnia-Atlantica 2007–2013
www.botnia-atlantica.eu
Sweden-Norway 2007–2013
http://www.interreg-sverige-norge.com/
Öresund-Kattegatt-Skagerrak 2007–2013
http://www.interreg-oks.eu/se
Poland (Lubuskie)-Germany (Brandenburg) 2007–2013
Poland (Zachodniopomorskie)-Germany (Mecklenburg-Vorpommern and Brandenburg) 2007–2013
http://www.regierung-mv.de

European Territorial cooperation programmes - interregional programmes

INTERREG IVC 2007–2013
www.interreg4c.net
Urban Development Network Programme URBACT II 2007–2013
www.urbact.eu
ESPON Programme 2007–2013
http://www.espon.eu/main/Menu_Programme/

External cross-border cooperation within the European neighbourhood and partnership instruments:

Estonia-Latvia-Russia 2007–2013
www.estlatrus.eu
Latvia-Lithuania-Belarus 2007–2013
www.enpi-cbc.eu
Lithuania-Poland-Russia 2007–2013
www.cpe.gov.pl
Kolarctic-Russia 2007–2013
http://www.kolarcticenpi.info
Karelia-Russia 2007–2013
http://www.kareliaenpi.eu
South East Finland-Russia 2007–2013
http://www.southeastfinrusnpi.fi/
APPENDIX 5. THE INVESTMENT CONCEPT

The RECO Baltic 21 Tech project recognises that the investment process is one of the cornerstones for the successful organisation of municipal waste management.

This document aims at describing the investment process as a cycle, taking into consideration the complexity and continuity of the process, as well as the uncertainties related to the analytical tools, procurements, return on investments, evaluations, etc. It should provide practical assistance to all stakeholders interested in investments in municipal waste management.

The Baltic Waste Investment Concept identifies the following five phases of an investment process: drivers, analysis, decisions, implementation and evaluation.

The drivers phase describes legislation as the main direct force and environment/climate, economy and society as the main indirect forces. The outcome of this phase will be a clear definition of the objectives, addressing issues and challenges (main driving forces) as a basis for further analysis.

The analysis phase is divided into three major types of analysis:

i) Context analysis – where the national or regional perspective on waste management is the focus.

ii) Project analysis – where the investment project is clearly identified.

iii) Experience analysis – where lessons from successes and failures in similar projects in the region are synthesised.

The outcome of this phase will be two or three alternative solutions that can then be presented to decision makers. The decision phase is when the decision makers select one solution from the two or three alternatives presented to them.

It is important to remember and consider all different aspects (even if finances would normally play an essential role). This has been presented in a simplified scoring matrix. The outcome of this part will be one preferred solution, selected for implementation.
The implementation phase addresses several important aspects related to finance, procurement, construction works, operation and maintenance. The outcome of this part will be an investment that is completed and commissioned.

The evaluation phase is necessary in order to properly measure success and work towards continuous improvement. Two types of evaluation are suggested: performance evaluation, and evaluation of whether the objectives have been met. The outcome of this phase is an evaluation of the completed investment. All of the phases will be completed with a number of questions on the checklist. Finally, the importance of the complexity and continuity of the entire investment cycle is presented. Also, the significance of the waste management hierarchy for all phases of the investment cycle is stressed.
### APPENDIX 6. MEMBERS OF THE BALTIC WASTE MANAGEMENT COUNCIL

<table>
<thead>
<tr>
<th>Country</th>
<th>Organisation</th>
<th>Name</th>
</tr>
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<tbody>
<tr>
<td>Belarus</td>
<td>Waste management department of the Ministry of Natural Resources and Environmental Protection, Vilejsky housing and communal services (city unitary enterprise), Soligorsk executive committee, Ministry of communal services, Executive Director of the Public institution Operator of secondary raw materials, Expert</td>
<td>Siarhei Kuzmyankou, Victor Paulouski, Alyaksandr Kanivets, Irina Safronova, Natalia Grintsevich, Alexandr Gnedov</td>
</tr>
<tr>
<td>Estonia</td>
<td>Ministry of the environment, Estonian Investment Centre, Tallinn City Government, Estonian Embassy Sweden</td>
<td>Peeter EEk, Andrus Kimber, Andrus Pirso, Merje Michelis, Kertu Tiitso, Jaak Jõerüüt</td>
</tr>
<tr>
<td>Germany</td>
<td>Hamburg City Cleaning Company, German Embassy Sweden</td>
<td>Reinhard Fiedler, Sven Robert Ganschow, Dr Harald Kindermann</td>
</tr>
<tr>
<td>Latvia</td>
<td>Head of Development department, Ogre, Ministry of Environment and Regional development, Head of the Environment Department, Latvian Environment Investment Fund, Latvian Embassy Sweden</td>
<td>Jana Briede, Rudite Vesere, Gints Karklins, Aigars Lisovskis, Maija Manika</td>
</tr>
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<td>Country</td>
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<td>Poland</td>
<td>Polish Embassy Sweden</td>
<td>Adam Halaciriski</td>
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<td></td>
<td>Marshal’s Office, Mazovia Voivodeship</td>
<td>Andrzej Daniluk</td>
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<td></td>
<td>Waste Management Companies Directors’ National Forum of City Cleaning Systems</td>
<td>Wojciech Janka</td>
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<td></td>
<td>Polish Chamber of Waste Management</td>
<td>Piotr Przygonski</td>
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<td></td>
<td>The National Fund for Environmental Protection and Water Management</td>
<td>Małgorzata Skucha</td>
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<td></td>
<td>Ministry of the Environment</td>
<td>Małgorzata Szymborska</td>
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<td>Tomasz Uciński</td>
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<td></td>
<td>Ministry of the Environment</td>
<td>Piotr Woźniak</td>
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<tr>
<td>Russia</td>
<td>North Western International Cleaner Production Centre</td>
<td>Alexandr Startsev</td>
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<td></td>
<td>Russian Embassy Sweden</td>
<td>Vladimir Romanov (observer)</td>
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<tr>
<td>Sweden</td>
<td>Swedish Environmental Protection Agency</td>
<td>Sanna Due</td>
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<td></td>
<td>Swedish Ministry of Environment</td>
<td>Charlotte Broman</td>
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<td>Avfall Sverige (Waste Management Sweden)</td>
<td>Weine Wiqvist</td>
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<td></td>
<td>Swedish Agency for Economic and Regional Growth</td>
<td>Jenny Åström</td>
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<td>Pan Baltic</td>
<td>PAC Internal market coordinator</td>
<td>Evelin Kuuse</td>
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<td>PAC Hazards Coordinator</td>
<td>Jenny Hedman</td>
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<td></td>
<td>Council of the Baltic Sea States</td>
<td>Maxi Nachtigall</td>
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<td></td>
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<td>Krista Kampus</td>
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<td>Sam Grönholm</td>
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<td></td>
<td>HELCOM, professional Secretary</td>
<td>Mikhail Durkin</td>
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<tr>
<td>Financers</td>
<td>European Investment bank</td>
<td>Jonas Byström</td>
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<td></td>
<td>NEFCO</td>
<td>Magnus Rystedt</td>
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<tr>
<td></td>
<td>SEK</td>
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