

The recycling of waste must be increased through cooperation, advice and regulation

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Finland must increase recycling as it aims to be a model country of the circular economy

In order to save natural resources, the recycling of municipal waste must be increased. New, ambitious goals on the recycling of municipal waste have been issued in connection with the circular economy package of the EU, but currently Finland is far from reaching them. Significant changes in the current system are required in order to reach the goals.

Recycling can be increased by expanding the property-specific separate collection of bio-waste, plastic packaging waste and cardboard in particular, as well as increasing the efficiency of sorting. A uniform level of collection throughout Finland can be ensured by including more specific obligation limits on separate collection in the waste legislation¹, set on both household waste as well as the waste from administration, services and business activities. In order to control the environmental and cost effects, the obligations on separate collection could be limited to built-up areas. According to the report, the current system, in which the yard of the property has separate bins for each waste fraction, emptied by separate collection vehicles, is the most expensive way of increasing recycling. In order to reduce environmental and cost effects, new collection methods such as multi-compartment collection bins should be tested in small-house areas and at the edges of built-up areas. The efficiency of sorting can be increased by providing more advice.

Making the waste management responsibilities clearer enables cost-effective planning. The current model of division of responsibilities in packaging waste management can be improved by introducing a statutory cooperation procedure between producers and municipalities, in which issues such as the division of costs and the collection methods are agreed upon. The

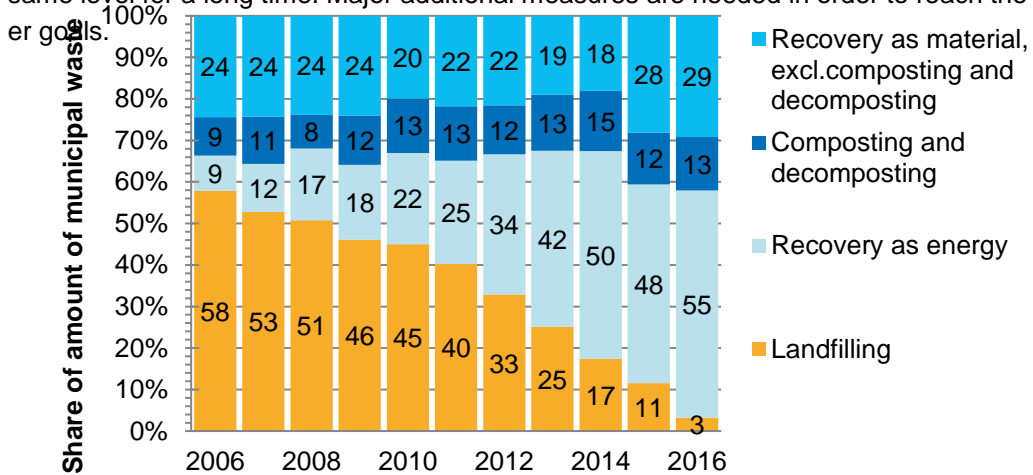
¹ Obligation limits refer to obligations to organise separate collection of waste on the property based on the number of apartments or other criteria. At the moment, obligation limits on residential properties have been set in the municipal waste management regulations.

dispersal of waste management responsibilities can also be clarified by removing the option of waste transport organised by the property holder from the Waste Act.

RECYCLING MUST BE INCREASED BY METHODS SUITED TO FINLAND

EU goals are becoming stricter

The reform of waste directives in 2018 made the recycling goals of both municipal and packaging waste stricter. According to the new goals, at least 55 % of municipal waste should be recycled by 2025. The goal will increase to 60 % by 2030, and in 2035 as much as 65 % of municipal waste needs to be recycled. In addition, biowaste must be collected separately or recycled at its place of origin (such as by composting it at home) by the end of 2023. The recycling goal of the new directive on packaging waste is 65 % by the year 2025 and 70 % by 2030. Separate goals have also been set for each packaging material. The current recycling rate of packaging waste in Finland is 41 % (see figure below), and it has remained at the same level for a long time. Major additional measures are needed in order to reach the stricter goals.



The change in the method of compiling statistics on fibre packaging can be seen in the data on 2015.

Figure 1. Different shares of municipal waste processing from 2006 to 2016. Source: Statistics Finland and the National Waste Plan; Figure: SYKE

In the autumn of 2018, the European Commission gave Finland recommendations² for increasing the recycling of municipal waste as a part of the so-called early warning procedure. The recommendations stated that the dispersal of responsibilities in municipal waste management makes reaching the recycling goals more difficult. Setting recycling goals on municipalities as well as an obligation to collect packaging waste were proposed as a solution, or alternatively a closer cooperation between municipalities and producer responsibility organisations. In addition, the implementation of various policy measures was recommended, such as financial steering methods to encourage recycling. In the current system, the obligation limits on the separate collection of domestic recyclable waste vary from region to region, and

² EU Commission 2018. COMMISSION STAFF WORKING DOCUMENT The early warning report for Finland. Brussels, 24.9.2018. SWD(2018) 417 final. http://ec.europa.eu/environment/waste/pdf/early_warning_report_FI.pdf

no separate obligation limits have been set on the recyclable waste from administration, services and business activities.

Goals, data and methods of the research

The JÄTEKIVA project for speeding up the circular economy by recycling municipal waste studied what kind of steering methods could be used to reach the stricter municipal waste recycling goals of the Waste Framework Directive and assessed the effects and suitability of the methods proposed by the Commission in the Finnish conditions. The goal of the project was to produce information to support the reform of the Waste Act.

By modelling municipal waste streams, information was produced on the extent of making the separate collection of municipal waste more efficient and how areas with different geography and population densities were taken into account. The cost analysis produced during the project provided information about the cost impacts of measures to increase recycling and opportunities for savings. In addition, information was collected on factors that had emerged during the life cycle assessments of biowaste collection and recycling and that have the most significant impact on the environmental and cost effectiveness of biowaste collection and recycling. The project also assessed the functionality of the current packaging producer responsibility systems as well as different kinds of options for the division of responsibilities for developing the producer responsibility system. In addition, models of obligations on separate collection, cooperation obligation between municipalities and producers as well as the division of responsibilities in packaging waste management were assessed from the perspective of the need to make changes to waste legislation.

Table 1. Partial studies and research methods

Study	Research method
Increasing separate collection	The effect of measures increasing separate collection on the recycling rate was assessed with the model used in the KEIKKA2 ³ project. The model includes the number of inhabitants per municipality, divided based on the different types of housing, the number of apartments as well as built-up and sparsely populated areas. In addition, the statistics on municipal waste in 2015 by Statistics Finland have been used as background information along with assumptions on inhabitant-specific accumulation of waste in different types of properties with regard to recyclable fractions, as well as information on the composition of mixed waste.
Cost analysis	The cost analysis was carried out by modelling the operative and administrative costs of the policy options presented in the trial of the EU's early warning procedure. By modelling municipal waste streams, it was investigated what it would take to reach the goals of 55 % and 65 %, and the additional costs to the current system caused by six waste collection systems were calculated.
Environmental impact of the collection and recycling of biowaste	The environmental impact of increasing the recycling of biowaste was studied based on the life cycle sustainability assessments concerning the separate collection and processing of biowaste in Finland and elsewhere in Europe.
Study on the producer responsibility system for packaging waste	The functionality of the current collection system was assessed based on the electronic questionnaire sent to the actors, supplementary expert interviews, as well as literature and statistics. The comprehensiveness of the collection system was assessed by using geographic information analysis. Models on the division of responsi-

³ Salmenperä, H., Sahimaa, O. & Koutonen, H. 2018. Recycling: guidance instruments, economic impacts and feasibility. Reports of the Ministry of the Environment 17/2018.

	bilities in packaging waste management and the need to change legislation were assessed by experts with the help of literature as well as a workshop.
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Results and conclusions

Increasing separate collection

According to the results of the project, the recycling rate of municipal waste should be increased by increasing property-specific separate collection and improving the efficiency of sorting. Property-specific separate collection can be increased by introducing stricter obligations on separate collection and tightening the current obligation limits.

The obligation limits on property-specific separate collection of household waste as well as waste from administration, services and business activities imposed by the Waste Act can focus on properties in built-up areas. This ensures comprehensive collection in all population concentrations throughout the country and takes the long transport distances in sparsely populated areas into account. Even the Waste Framework Directive states that exceptions to the obligation limits can still be made, if separate collection would result in significant costs and a negative environmental impact. Like now, the inhabitants of sparsely populated areas would still be served by regional recyclable waste collection points. Significant types of waste with regard to increasing the recycling rate are biowaste, plastic waste as well as cardboard. The efficiency of sorting can be affected by offering more advice to the producers of waste. In fact, more resources should be allocated to providing advice.

One recipe for increasing recycling is to make sorting easy and bring the collection close to the property.

Increasing property-specific separate collection leads to an increased amount of waste transport. By reforming waste management practices, the harmful environmental impact can be reduced. New collection practices, such as multi-compartment collection, joint collection of recyclable waste fractions or collecting recyclable waste together with neighbours may reduce the resulting negative impact. Lengthening the interval between emptying waste bins determined by the municipal waste management regulations can also create significant environmental savings. Waste logistics planning in cooperation between the key actors and joint procurements with cost distribution arrangements can also improve efficiency.

Packaging producer responsibility system

Packaging is a part of the municipal waste stream, and it is also important in raising the recycling rate of municipal waste. The current packaging collection system meets the requirements of waste legislation well, and the actors are mainly pleased with the functioning of the collection system. However, the current system is not enough to reach the municipal waste recycling goals of the revised Waste Framework Directive; instead, the separate collection of plastic and cardboard packaging in particular must be increased.

The Commission's recommendation to Finland was to make the division of municipal waste management responsibilities clearer or at least increase the cooperation between producers

and municipalities significantly in order to promote the recycling of municipal waste. The options for the division of responsibilities investigated are related to the operative responsibility of packaging waste management. In the current system, municipalities and in some areas also the property holders organise the collection of packaging in addition to the producers. The current model could be developed by including a cooperation obligation for the producers and municipalities in the Waste Act. The agreement would determine for example the distribution of costs. A model including a cooperation obligation is supported by its acceptance by the different parties, among other things. To clarify the division of responsibilities further, the municipalities' option of choosing waste transport organised by the property holder in their area should be removed.

Even more cooperation between municipalities and producers is needed, and voluntary activities are not enough to ensure its realisation.

Cost impact

In the short term, increasing separate collection and recycling means increased costs. Based on the results of the project, aiming at the recycling rates of 55 % and 65 % may even be profitable for Finland in the long term. Reaching the goals requires the recycling market to develop significantly as well as a clearer division of responsibilities, and especially a closer cooperation between the actors.

Cost savings should be sought from the different stages of the collection and recycling chain. According to the results of the survey, as the property-specific separate collection expands, the current system with its separate bins and collection vehicles for each material stream is the most expensive way of reaching the recycling goals. For this reason, new collection methods, such as multi-compartment collection or joint waste collection should be introduced in the areas surrounding population concentrations and in small-house areas.

The reliability of waste information and the accuracy of information systems form the basis of targeting waste management steering methods. The deficiencies of the current waste information system should be corrected as soon as possible in order to gain region- and field-specific waste information, among other things.

Summary of the proposed measures

1. The proposed obligation limit for separate collection in households is biowaste collection on all properties as well as cardboard, metal, glass and plastic collection on all properties in built-up areas.
2. Concerning administration, services and business activities, the proposed obligation limits involve separate collection on all properties in built-up areas as follows:
 - a. Biowaste: must be collected if generated, **or** if there is food preparation/a canteen/a food shop on the property and if at least 20 kg/week of biowaste is generated
 - b. Paper: must be collected if generated
 - c. Cardboard packaging: must be collected, if at least 10 kg/week is generated

- d. Glass packaging: must be collected, if at least 10 kg/week is generated
 - e. Metal: must be collected if generated
 - f. Plastic packaging: must be collected, if at least 10 kg/week is generated
3. In order to increase sorting efficiency, increasing resources for providing waste advice is proposed.
 4. The division of municipal waste management responsibilities must be clarified and cooperation between municipalities and producers must be increased. The option of a municipality choosing waste transport organised by the property holder must be removed.
 5. In order to target the steering methods, the waste information system must be developed and pilots on the use of new collection systems must be implemented.
 6. The municipal waste management regulations should allow an emptying interval of biowaste bins of at least two weeks during the summer and four weeks during the winter.
 7. In the biowaste management life cycle assessments, the nutrient cycle should also be studied with regard to the environmental impact in addition to the climate change impact. The probable changes in energy production in the near future should also be taken into account by means of scenario or sensitivity studies, for example.

Recycling municipal waste saves natural resources, reduces the negative environmental impact and promotes circular economy.

Further reading

Final report:

Salmenperä, H., Dahlbo, H., Kauppila, J., Kautto, P., Niskanen, A., Papineschi, J., Sahimaa, O., von Eye, M., Durrant, C., Kaitazis, N., Kemppi, J., Tomes, T., & Autio, I. 2019. Increasing the recycling of municipal waste in Finland – measures and their impact Publications of the Government’s analysis, assessment and research activities 15/2019. February 2019.

Separate studies:

Niskanen, A. & Kemppi, J. 2018. Analyysi biojätteen erilliskeräyksen ja käsittelyn kestävyystarkasteluista näkökulmana mahdollisuudet kestävyden tehostamiseksi.

Eunomia Research and Consulting. 2018. Increasing Recycling Sustainability in Finland - Cost Analysis of the Methods of Increasing Recycling.

Further information:

The research topics of **Senior Coordinator Hanna Salmenperä**, **Senior Research Scientist Petrus Kautto** and **Senior Research Scientist Jussi Kauppila** from SYKE include waste policy steering methods, among other things. https://www.syke.fi/fi-FI/Tutkimus__kehittaminen

The JÄTEKIVA project for speeding up the circular economy by recycling municipal waste was realised as a part of implementing the Government's plan for analysis, assessment and research in 2018.

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