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1 Introduction on bio-waste management in *Estonia*

In Estonia, biowaste legislation is in place and end-of-waste criteria can be applied. Household biowaste is collected in urban areas from larger blockhouses (e.g. 10 flats). Collection rate is not yet the best, because of economic reasons. Collection of municipal waste is organised by municipalities, and run by private waste companies on basis of public procurement. Usually, the contract is for 3 to 5 years. This has reduced waste collection price below the level where additional collection of biowaste becomes too expensive.

Park waste from city parks and green areas is also collected. In some cases, also III cat ABPR is composted together with biowaste. ABPR composting legislation is in place.

Dominating composting method is windrow composting. In few cases, they are covered by membrane (Company). There are few tunnel-composting sites. Reactors are used mainly in case of ABPR. Trommels are used only for composting of sludge from food industry or sewage plants.

Predominately largest share in composting is sludge composting.

AD is practiced in WWTP only, there are no AD plants for solid waste.

Market for compost exist, but is low. Biowaste compost is used in private farming and city-greening rather than agriculture. Sludge compost is used both in agricultural and city-greening purposes.

The initiative for developing compost comes from Recycling Cluster: www.recycling.ee

2 National concept/strategy on bio-waste management

2.1 Legal framework

- Requirements for producing compost from biodegradable waste – Estonian Regulation from 2013 Sets the end-of-waste criteria for compost. <https://www.riigiteataja.ee/akt/110042013001?leiaKehtiv>
- Requirements for digestate which is produced during biogas production from biodegradable waste, May, 2016 <https://www.riigiteataja.ee/akt/119052016009>
- Requirements for manufacturing of products from sewage sludge, July 2017. Sets requirements for the production and use of sewage sludge. <https://www.riigiteataja.ee/akt/128072017004>
- Requirements for using sewage sludge for agriculture, landscaping and re-cultivation (as a waste), <https://www.riigiteataja.ee/akt/761407?leiaKehtiv>
- Waste Act <https://www.riigiteataja.ee/akt/114062013006?leiaKehtiv> in English: <https://www.riigiteataja.ee/en/eli/523122016001/consolide>

2.2 Waste management programs and strategies

In national waste management plan 2014-2020, the 50:50 approach is adopted.

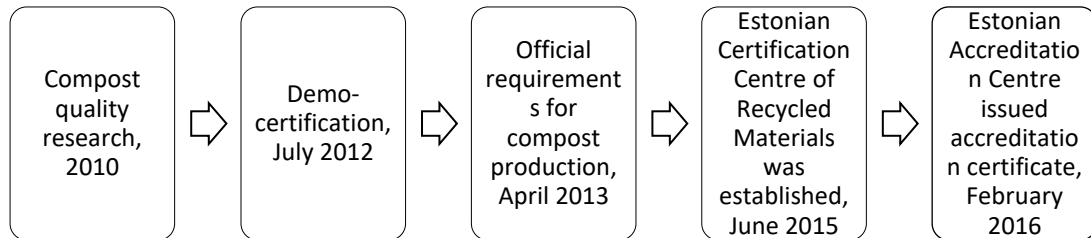
National funding system is in place to support recycling, composting and biowaste treatment www.kik.ee

2.3 National standards and technical guidelines (collection, treatment and use)

- Requirements for producing compost from biodegradable waste – Estonian Regulation from 2013 Sets the end-of-waste criteria for compost. <https://www.riigiteataja.ee/akt/110042013001?leiaKehtiv>

2.4 Quality Assurance Scheme (QAS) and National Quality Assurance Organization (NQAO)

/describe main, structure, aims and the functions of your NQAO and the main elements and requirements of QAS certification scheme/



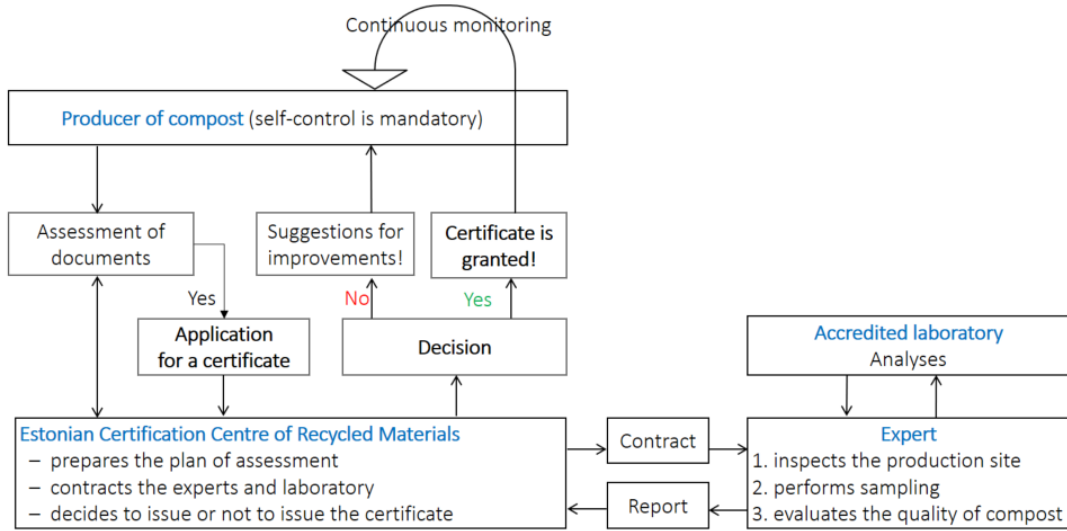
- 2010: Recycling Cluster was formed as initiative of waste companies and educational institutions. Preliminary study on identifying compost amounts and producers was carried out.
- 2011: involvement in drafting regulation “Requirements for producing compost from biodegradable waste”.
- 2011 to 2014: research in co-operation with Estonian University of Life Sciences to understand the quality of different composts. Chemical properties of composts were studied along with germination tests, pot and field trials;
- 2012: demo-certification in one composting site under supervision of experts from European Compost Network;
- 2013: National regulation “Requirements for producing compost from biodegradable waste” in force. Estonian Waste Recycling Competence Centre was established as a candidate of “Certification Centre”; This non-profit organisation was meant to promote waste recycling in Estonia and support waste companies in producing high quality certified materials from waste (compost, digestate, construction and demolition aggregates). Market survey on compost was carried out.
- 2015: Estonian Certification Centre of Recycled Materials was established. First official certification event was performed in December at the composting site of Väätsa landfill Ltd in presence of National Accreditation Centre.
- 17 Feb 2016: Estonian Accreditation Centre issued accreditation for Certification Centre of Recycled Materials;
- 16 Mar 2016: First Certificate of Quality Conformity was issued for Väätsa landfill Ltd. Certified compost becomes available on the national market. New applications for certification of compost are received.
- 22 May 2016 National regulation “Requirements for biogas digestate generated from biodegradable waste” in force.
- 19 July 2017 National regulation “Requirements for manufacturing of products from sewage sludge” in force.
- 09 Oct 2017 Certification Centre of Recycled Materials got accreditation to certify sewage sludge compost.
- 27 Feb 2020 Certification Centre of Recycled Materials got accreditation to certify digestate.
- 13 July 2020 First certificate for digestate issued to Vinni Biogas plant

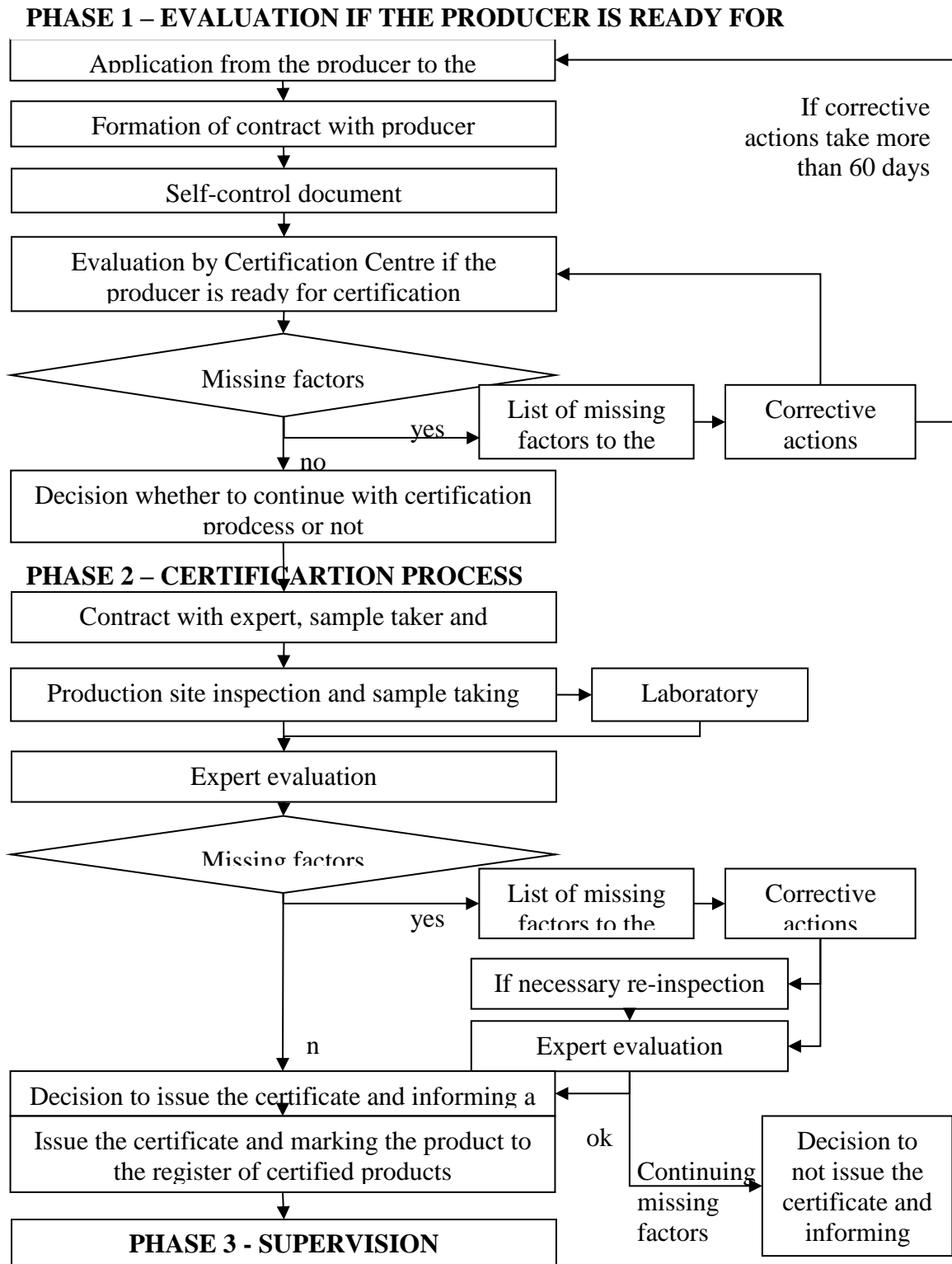
In 2013 the regulation “Requirements for producing compost from biodegradable waste” was enforced in Estonia. The ordinance regulates and sets requirements for the production site, production technology and limit values for various parameters.

In 2016 the regulation “Requirements for biogas digestate generated from biodegradable waste” was enforced in Estonia. The regulation is an end-of-waste regulation enabling producers of digestate generated from biodegradable waste to certify digestate as a product.

In 2017 the regulation “Requirements for manufacturing of products from sewage sludge” was enforced in Estonia. The regulation lays down requirements for manufacturing products made from sewage sludge.

The accredited organization in Estonia which carries out certification of compost is Certification Centre of Recycled Materials.





The quality parameters for compost are (from Estonian Regulation - Requirements for producing compost from biodegradable waste)

Precautionary quality criteria	Parameter	Limit value
Hygiene	Salmonellae	Absent in 25 g dry matter
Undesired ingredients and properties	Impurities	≤ 0,5 % dry matter
	Viable weed seeds	≤ 2 seeds per litre
Inorganic pollutants	Lead (Pb)	130 mg/kg dry matter
	Cadmium (Cd)	1,3 mg/kg dry matter
	Chromium (Cr)	60 mg/kg dry matter
	Copper (Cu)	200 mg/kg dry matter
	Nickel (Ni)	40 mg/kg dry matter
	Mercury (Hg)	0,45 mg/kg dry matter
	Zinc (Zn)	600 mg/kg dry matter

Quality criteria	Parameter	Dimension	Appraisal
Soil improvement	Organic matter	% d.m.	≥15 %, declaration
Fertilizing properties	Nitrogen (N) total	% d.m.	Declaration
	Phosphorus (P) total	% d.m.	Declaration
	Potassium (K) total	% d.m.	Declaration
Material properties	Maximum particle size	Mm	Declaration
	Bulk density	g/l	Declaration
	Water content	g/l	Declaration
	Salinity/El. Conductivity	mS/m	Declaration
	pH		Declaration

Quality parameters for digestate is available in Estonian here

https://www.riigiteataja.ee/aktiis/1190/5201/6009/KKM_10052016_m12_Lisa2.pdf#

Quality parameters for products made from sewage sludge is available in Estonian here

https://www.riigiteataja.ee/aktiis/1280/7201/7004/KKM_19072017_m24_lisa2.pdf#

3 Source separated collection of bio-waste

The total amount of biowaste that can be used in production of certified compost (the waste codes listed in the regulation “Requirements for producing compost from biodegradable waste” in 2017 was 438 000 tons, and in 2018 the amount 440 000 tons.

Year	20 01 08 Biodegradable kitchen and canteen waste Generated, t	20 02 01 Biodegradable waste (20 02 garden and park waste) Generated, t
2017	14 100	26 400
2018	20 200	21 500

4 Bio-waste treatment (recycling, material/energy recovery)

MBT was dominating during the period before commissioning of Iru Mass-Burn facility. Now, MBT is used only as a technology for production of RDF/SRF for cement industry.

AD of biowaste is not practiced in Estonia but 2 projects in process.

Solid state AD is not practiced in Estonia.

AD exists in WWTP-s mainly (4-5). In two of these, semi-liquid wastes can be included into sludge

There are 4-5 AD plants for manure/slurry.

No AD exists for biomass.

There is one AD at yeast factory, one very large AD at pulp industry, and at least one AD for industrial waste.

There are no pure ABPR digestion of composting. In several composting sites, ABPR is added to composting process.

An overview of the geographical location of biowaste treatment facilities in Estonia with a permitted treatment quantities (permitted in the environmental permits) of sewage sludge and biodegradable waste is presented in the figure below. Includes main treatment facilities, not all.

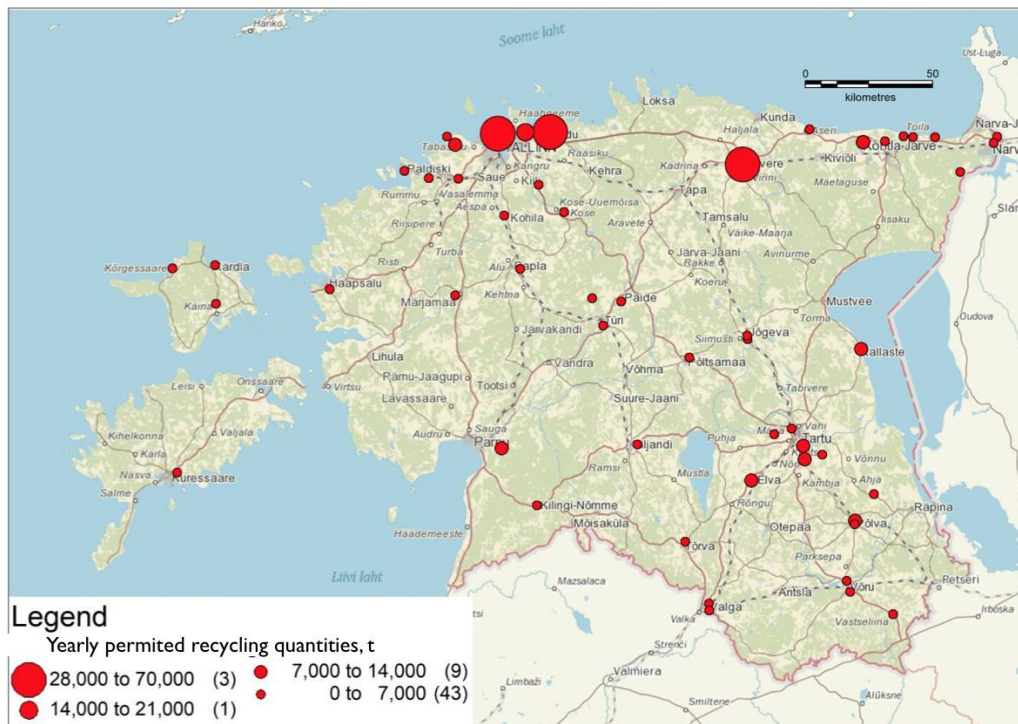


Figure 1 Yearly permitted recycling quantities. From study by Civitta Eesti and Alkranel https://www.envir.ee/sites/default/files/biolagunevatest_jaatmetest_materjalide_kasutamise_uuring_kodulehe.pdf



Some manure compost on the market

Some worm-composting activities

There are 5 sanitary landfills in Estonia. In 3 of them, composting is used. In addition, there are several large composting plants, and ten of small to very small composting sites at municipal recycling centers.

5 Application and market

Certified compost can be used as a product and there are no limitations.

If compost is produced from biodegradable waste and is not certified then it is classified as waste and can be used by companies that have waste permit or who apply registration from Environmental Board.

6 Expected trends and developments

In Estonia, R3 code has sub-codes, e.g. composting is categorized as R3o. This code is nominated in case of end-of-waste approach. Under waste regime, R12 is used.

End-of-waste criteria for sewage sludge products (incl compost) was enforced in 2017. At a moment no plants for sewage sludge compost have been certified.

First certificate for digestate was issued in July 2020. In some companies, the certification process is ongoing.

7 Contacts and sources of information

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Website: <http://www.recycling.ee>
Annexes (Please attach any regulation, directive on bio-waste, fertiliser etc. of your country)

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About

