Municipal waste management for textile circularity

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Municipal waste management company

- Located in South-West Finland
  - Co-owned by 17 municipalities
- Collecting post-consumer textiles since 2016
- Goal is to:
  - establish a nationwide handling model for post-consumer textiles
  - provide opportunities for textile circularity in Finland

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Textile is the only high value fraction left in mixed municipal waste

Municipal waste management companies

• Are responsible for residual household waste – also textile waste
• Guided by waste hierarchy and waste prevention
• Can act as neutral circular economy platforms
• EU requirement for separate collection of textile waste in 2025
  • 2023 in Finland?
• National and international cooperation
  • Between public waste management / research / industries
Development approaches

Comprehensive solution requires simultaneous development:

1. Separate collection and pre-sorting of post-consumer textile
2. Sorting and refinement plant
3. Cooperation with stakeholders and industrial partners
Comprehensive solution

COLLECTION

PRE-SORTING

OPTICAL MATERIAL IDENTIFICATION AND SORTING

REFINEMENT PLANT

FROM FIBERS TO FINAL PRODUCTS
Nationwide operating model
- mutual practices in collection

- Collection at waste treatment centers / sorting stations
- Supplementary collection schemes:
  - Second hand markets
  - Supermarkets / shopping centers
  - Clothing and fashion stores
    - Transparent collections models in cooperation with municipal waste management
    - Possible EPR models
- Handling services for businesses

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Nationwide operating model
- mutual practices in sorting operations

• Regional pre-sorting with local partners
  • All textiles to be sorted with same instructions

• Sorted textiles are transported to the pilot refinement plant in Turku region
  • Handling contracts and shared costs between MWMC’s

• Development of collection and presorting is synchronized with the refinement plant schedule
  • Expansion to nationwide textile collection is to be organized in phases by 2023
Optical material identification

• Hand-held NIR devices to supplement manual sorting
  • Development with Finnish technology partner Spectral Engines

• Able to separate monomaterials from blended textiles
  ✓ purity requirements for recycling technologies

• Schedule:
  • 2019: development, testing and validation of results
    ➢ Evaluation for operational suitability
  • 2020: operational test phase
    ➢ Devices shared with partners in multiple locations

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Refinement plant

- Sorting
- Cutting
- Hard parts removal
- Opening the fibers
Industrial partnerships

- Sorted textiles to be mechanically refined into recycled fibers
  - Yarn, non-wovens, composites, chemical refinement...
- High added value ensured by high quality sorting systems
- Ability to supply the textile industry with recycled raw material
  - Process and product development in cooperation with customers/partners

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Schedule and possibilities

• 2019 – 2021 Pilot phase
  • Scheme development, handling contracts, procurements, facility + operation start-up
  • Capacity 1 000 ➔ 5 000 t/a

• 2022– 2024
  • Scale-up to match national textile volumes and needs
  • Possible public/private/nordic/baltic partnerships
  • Capacity 5 000 ➔ 20 000 t/a

• 2025 ➔
  • Services for Baltic Sea region
  • Capacity 20 000 ➔ 100 000 t/a?
Comprehensive solution

Found yourself? Come and meet us!