



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



**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

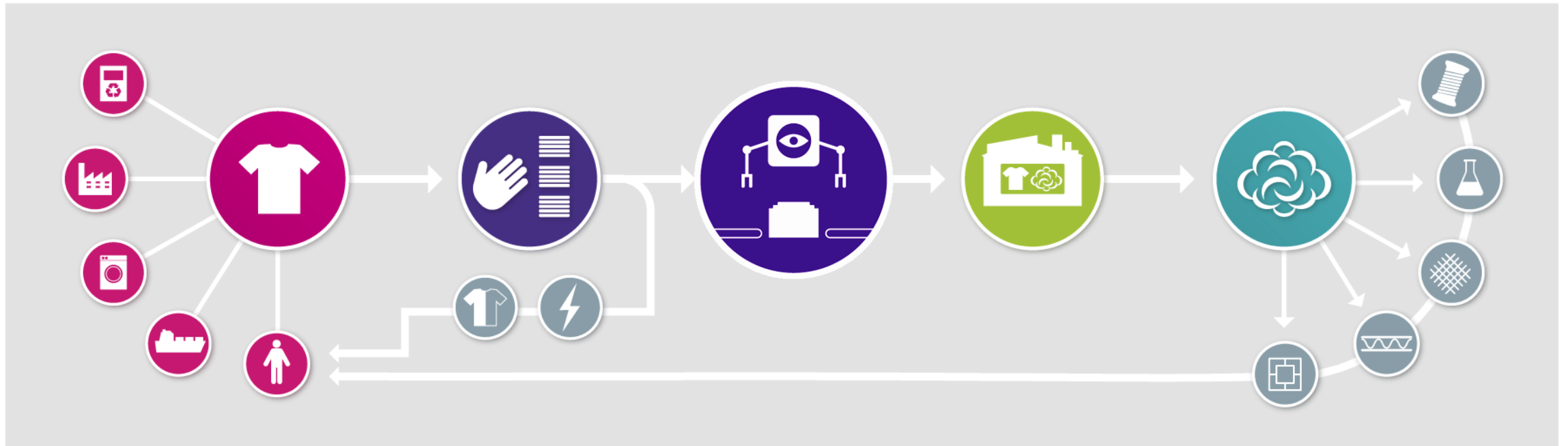
Comprehensive solution requires simultaneous development:

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





Comprehensive solution



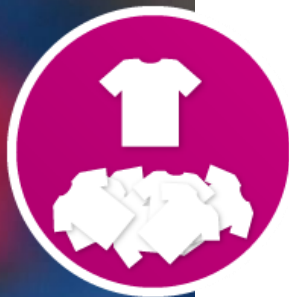
COLLECTION

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



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



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



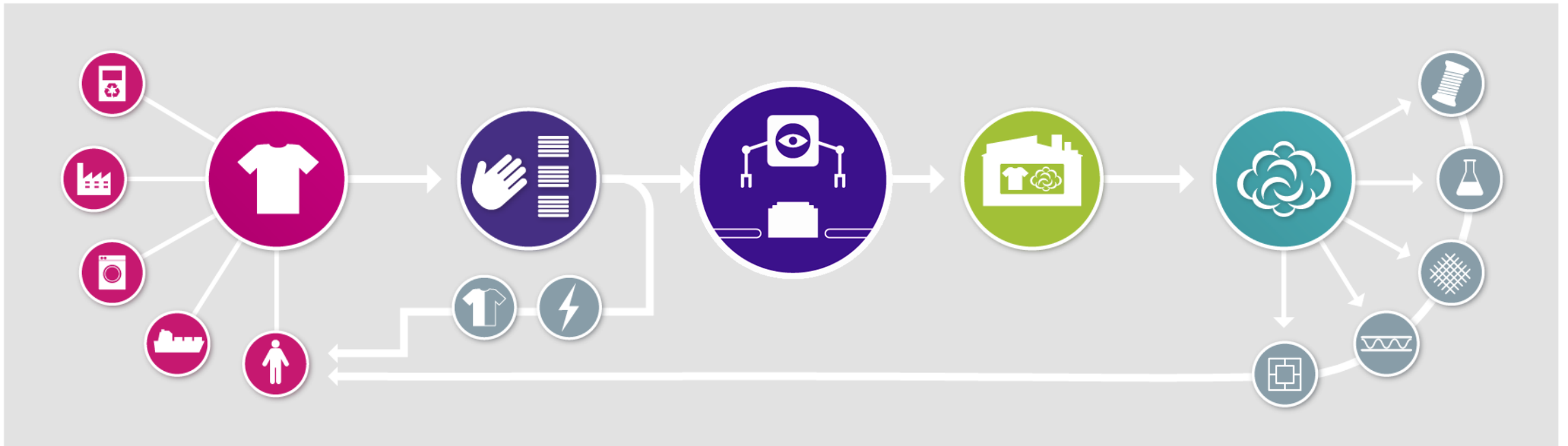
Schedule and possibilities

- 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!