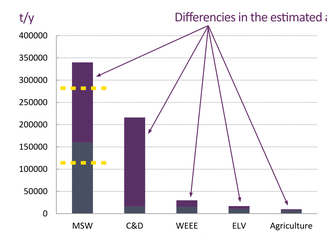
Recycled plastics in Finland

Amounts, quality and future applications

Reetta Anderson (Ekokem), Helena Dahlbo (SYKE),
Hanna Eskelinen (SYKE), Valeria Poliakova (Arcada), Hanna Salmenperä (SYKE)

Plastic waste arisings in Finland (t/y)



- Summary was based on estimates found in literature
- Uncertainties in the estimated amounts are substantial, especially for MSW and C&DW
- Largest source of post-consumer plastic waste is MSW
- Plastic packagings are the dominating products
- The amounts will be re-estimated with more accurate data obtained within ARVI

(Sources: Salmenperä etc. 2015, Hiipakka 2012, Merta etc. 2012, PYR 2012)

Current applications for recycled plastics:

1. Packaging (PET-bottles, films, bags, cases)
2. Agriculture and earth construction (films, cylinders, etc.)
3. Construction and industry (profiles, die-casting products, shields etc.)
4. Other (buckets, hangers, composting equipment, etc.)

(Source: Kärhä 2015, Plastic Industry ry)

2D multilayer plastics
Photo: Valeria Poliakova, Arcada

Potential future applications for recycled plastics in Finland

Criteria used for evaluating areas of applications:
- Colour or odour of the material does not play a role
- Demanded volumes are high
- Possibility to recycle the material even after the first recycling

Examples of potential applications

GEOSYNTHETICS
- Geotextiles – separation, filtration, protection and drainage applications
- Geogrids – stabilising and reinforcing the ground
- Lightweight Fill Material – reduce the loads imposed on adjacent and underlying soils and structures

WASTE WATER TREATMENT
- Supporting structures for waste water, storm water and gas filtration systems
- Treatment of wastewater from municipalities, mining, agricultural and peat production

TEMPORARY ACCOMMODATION AND CLASSROOM STRUCTURES
- In exceptional circumstances (crises, catastrophies)

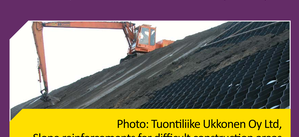


Photo: Tuontiliike Ukkonen Oy Ltd,
Slope reinforcements for difficult construction areas

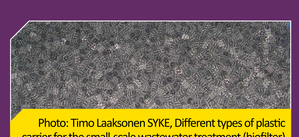


Photo: Timo Laaksonen SYKE, Different types of plastic carrier for the small-scale wastewater treatment (biofilter)

Photo: Timo Laaksonen SYKE, Different types of plastic carrier for the small-scale wastewater treatment (biofilter)

Photo: Wavin-Labko Oy, Rainwater recovery system for temporary storing and infiltration

Quality studies of the municipal solid waste plastics

- Sorting studies made in ARVI programs MSW and Plastics themes
- First phase: Quality studies of the household mixed waste in Riihimäki and Turku
  - Manually sorting to the 38 different waste fractions
  - Plastics sorted in in 3D (rigid) and 2D (soft) fractions
- Second phase: Further sorting of the plastic fractions
  - Manually sorting to the 27 different plastics fractions
  - Monotypes and mixtures of plastics identified within 2D, 3D and black plastics
- The identification of the different plastics was made utilizing knowledge of optical and mechanical characteristics, typical applications and recycling coding system
- Altogether around 300 kg were sorted
- Factors affecting the results were evaluated
- More case studies and consolidation of the results are planned for the 2nd phase

Plastic fractions of the household mixed waste