Biosykli – Circular Bioeconomy in Lahti Region

Plastics in Carbon Neutral and Biocircular Economy Webinar

Vesa Taitto / The Finnish Plastics Association

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THE REGIONAL COUNCIL OF PÄIJÄT-HÄME
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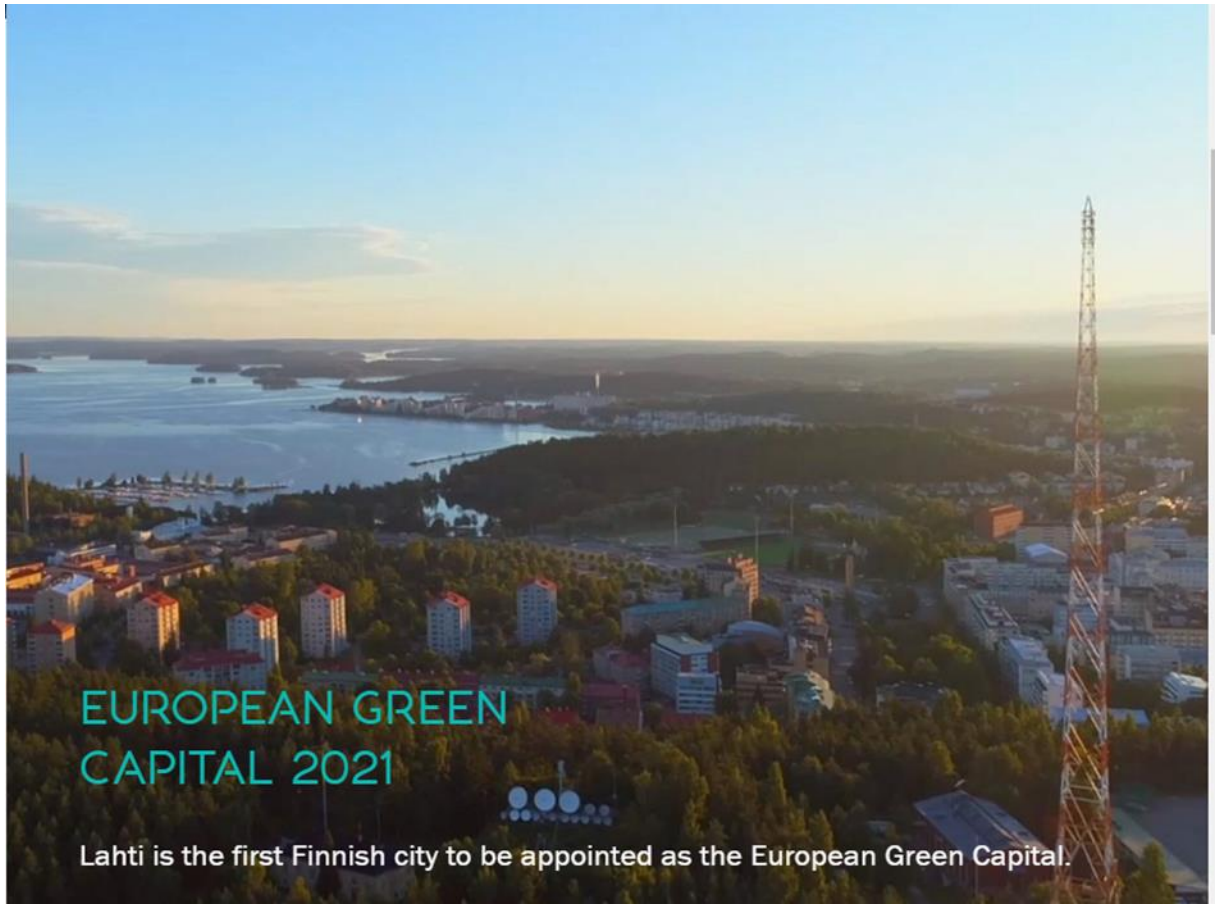
LAHTI



The Finnish Plastics Association in a nutshell

- 3rd oldest plastics association in the world (1940)
- Over 1200 members from about 600 companies
- Raw material suppliers, machine suppliers, designers, manufacturers, students, universities / research institutes
- MuoviPlast- magazine
- Organizing events, e.g. Extrusion Days, Injection Molding Days
- Organizing travels e.g. to Fakuma, ChinaPlas, K-Messe
- Networking - > an excellent way of finding new opportunities by knowing more people

CONNECTING PLASTICS PROFESSIONALS

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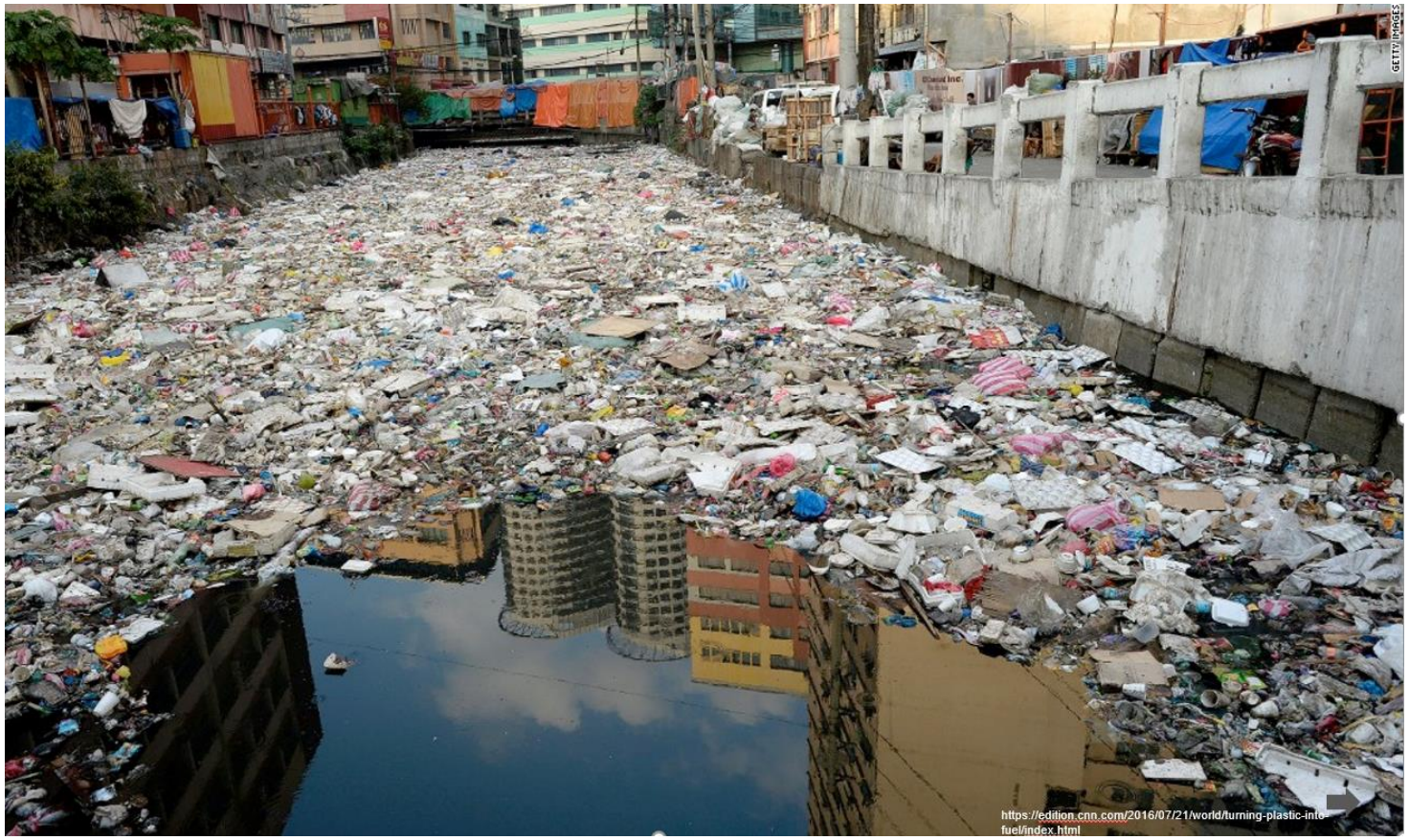
Biosykli project background

- EU Bioeconomy Strategy (2018) – sustainability and circularity
- Know-how, specialization and interest in Lahti region
- Project for developing and promoting bio-based, low carbon solutions and new sustainable business in the region
- 1.9.2019 – 30.8.2022
- Co-ordination by LAB University of Applied Sciences
- Partners
  - LUT University
  - University of Helsinki
  - Lahti Region Development LADEC Ltd
  - Päijät-Häme Waste Management Ltd
  - The Finnish Plastics Association

Biosykli project main topics

- Developing effective biowaste collection
- Exploiting organic waste as a raw material for biodegradable products
- Developing use of biobased plastics
- Developing carbon dioxide cycles and promoting the use of biogenic carbon dioxide
- International promoting of Lahti as a region for biocircular economy

Is this about material choice? Root cause?



What do we want to achieve? What is needed?

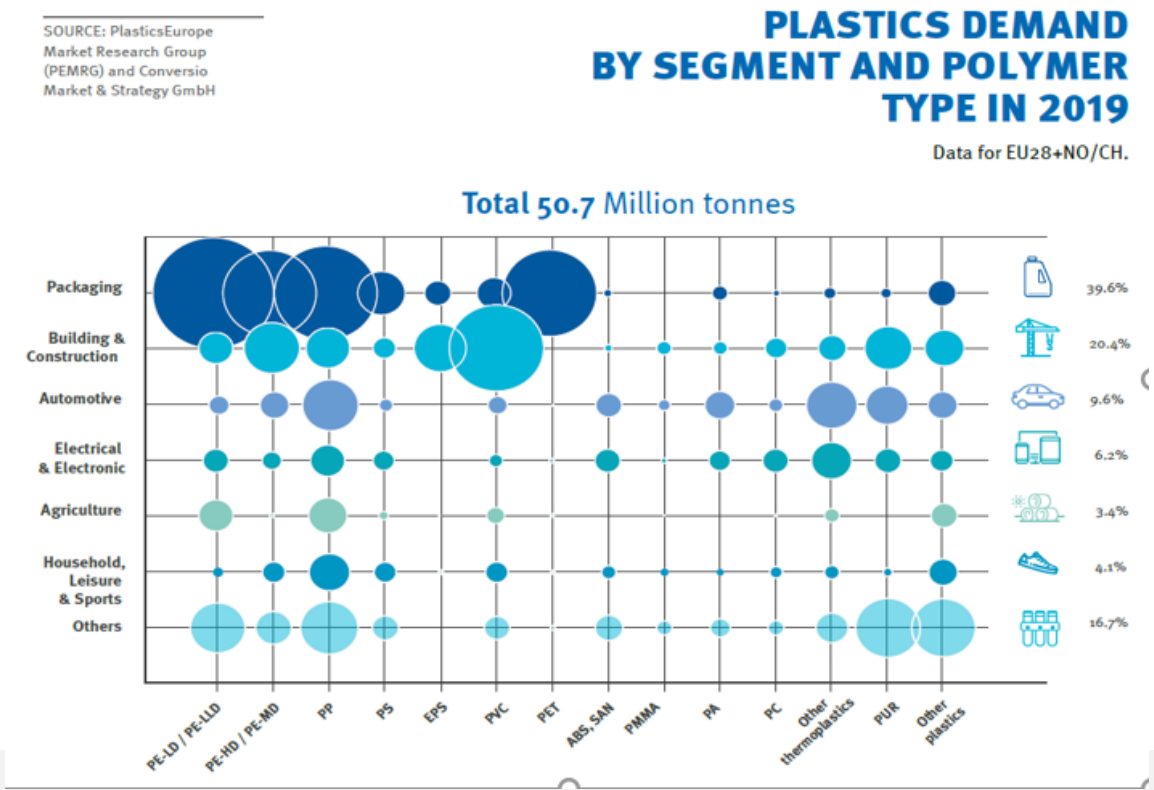
RIGHT ACTIONS

MANY SOLUTIONS

OBJECTIVITY

Biosykli project interviews in Finland

- Manufacturers of plastic products (mainly extrusion and injection molding) supplying to many industries
- Machine manufacturers / suppliers
- Raw material manufacturers / distributors
- Interviews representing plastic demand by segment and resin type in Europe



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Biosykli interviews - general findings

- In general, a holistic approach is needed when considering plastics and environment / reducing CO2 footprint. We (and EU) have to ask the right questions, for example:
  - ~~How to avoid plastic in packaging?~~ More relevant questions: How to minimize food waste? How to maximize safety? What kind of structures are ideal for recycling? How to increase shelf life? How to minimize environmental impact (many criteria)? How to minimize littering?
  - ~~How to decrease plastic use in buildings?~~ More relevant questions: How to build energy efficient buildings? How to minimize water usage? How to design long lasting buildlings? How to design structures for easy recycling?
- Companies have clearly more focus on sustainability / environment than e.g. 5 years ago; environmental management systems, projects, LCA, recyclability etc.
- Energy and material efficiency depend on materials also; not possible to subobtimize
- Many companies have very general targets related to the use of recycled and/or biobased materials. To have exact numerical targets is an exception.
- Still a lot of confusion related to terminology, marketing claims, measurability

Key findings – circular economy is seen as an opportunity

- All big players have major announcements / investments going on in circular economy (big wheel turning)
  - Machine suppliers, raw material suppliers, brand owners
- Even smaller companies see circular economy as an opportunity i.e. this is not a question of attitudes
- The image of recycled materials have changed, especially b-to-c, using recycled materials can be a sales argument (earlier only about cost saving)
- Internal recycling is already there (material efficiency)
- Efforts in having more recyclable structures, e.g. BOPE/PE film structures
- Quality of recycled raw materials getting better, e.g. hybrid compounds
- Digitalization can help in shift towards circular economy
  - Traceability needed, Holy Grail project
  - Managing production process / machines gets easier

Photo:Shutterstock

Key findings – there are quite a lot of limitations

- Communication / information related to new EU regulations is confusing, e.g. SUP directive isn´t any good news for recycling (plastics are ideal for recycling)
- Legislation; you cannot use recycled plastics in many applications
- Technical constraints (mechanical recycling):
  - Using recycled materials is always a compromise. In many technically demanding applications, there isn´t any room for compromises.
  - Variation between different batches of recycled materials
  - Learning curve needed in production (more work)
  - Limited colour options, smell in some cases,
- PET is the only available, approved recycled raw material for food packaging.
- Virgin material prices are close. In some cases recycled could be even more expensive.
- Sometimes (compounds) recycled content is not informed i.e. you don´t know how much recycled content there is

What is preventing the use of biobased plastics?

- Volumes globally growing, but fossil based volumes are growing much more. The absolute growth figures are very modest.
- Prices are very high:
  - Drop-in biobased plastics (PP, PE) are about double vs. fossil based
  - Biodegradable plastics prices are sky-high
- Companies and their customers are ready to pay a higher price to some extent, but now the gap is too much for most companies.
- There are also availability risks as there are not many suppliers.
- Volumes are so low that there there isn´t recycling in practise (except drop-in plastics)
- Confusion, especially consumers but also companies, in terminology
- Companies are not all very convinced about environmental benefits
  - E.g. green washing, biobased definition, more energy consumption + waste (in some cases), lack of recycling,
- Mass balance: you get the same product, but pay double
- In most cases, this is not a technical challenge for companies

Conclusions

- Finnish companies see circular economy as an opportunity
- Increasing recycled plastics is mainly prevented by technical and legislative issues.
- Chemical recycling is needed to have circular economy running in plastics. Also there need to be more closed loops to guarantee high quality of raw materials.
- Biobased plastics prices are too high, but it is still a business opportunity.
- Limited applications with biodegradable plastics, but at the same time there is lack of this material
- There is a need for common guidelines for measuring environmental impact to avoid green washing. A more holistic approach is needed to protect our environment.
- Research in Biosykli- project are addressing concerns about environmental benefits in an excellent way:
  - University of Helsinki. PHA from sludge. There is a huge lack of this material in the market and getting it this way would be very sustainable.
  - LUT University. Power-to-plastics. Plastics could be a carbon sink in durable goods.

THANK YOU AND HAPPY NEW YEAR!