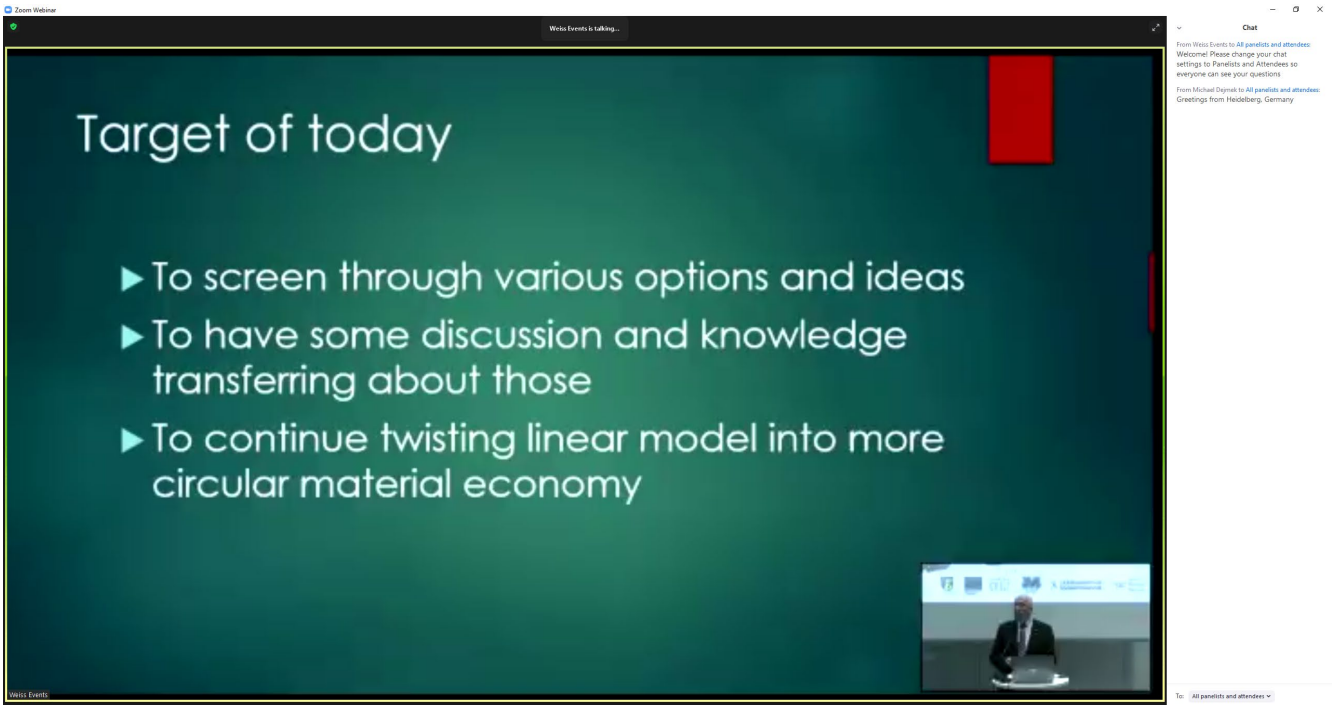
Plastics-webinar

16.12.2020 09.00–14.30

9.00 Opening of the seminar, Vesa Kärhä, Finnish Plastics Industries Federation

Looking for carbon neutral and circular economy. Renewable materials and feedstocks are coming to market.

Number of participants: 160



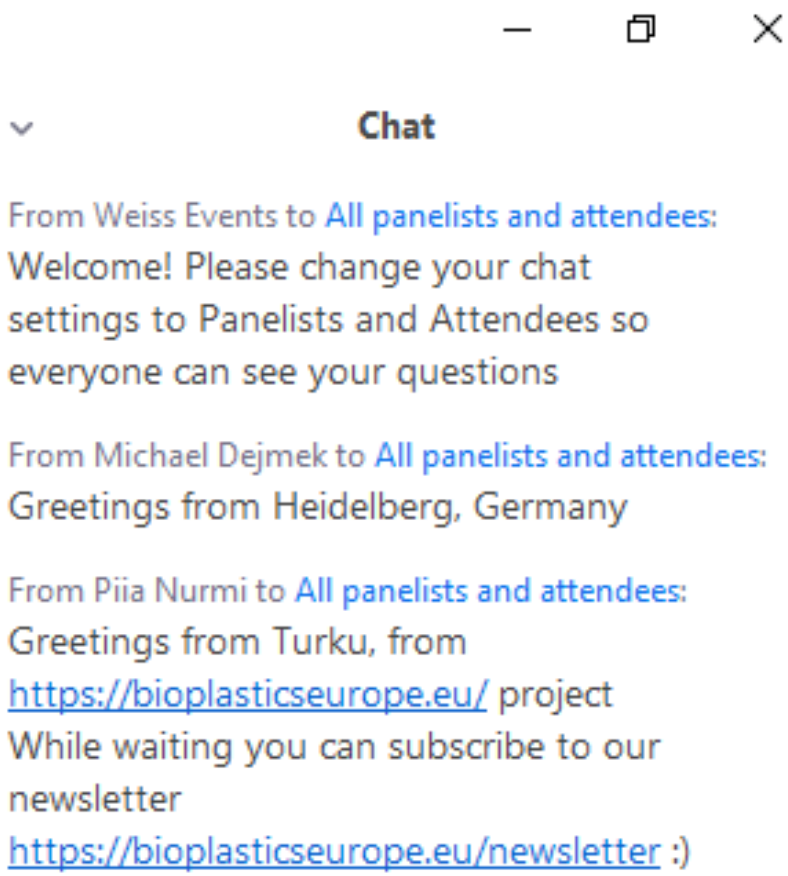
9.15 EU policy framework for bio-based plastics and biodegradable or compostable plastics,

Silvia Forni, Directorate-General for Environment, European Commission

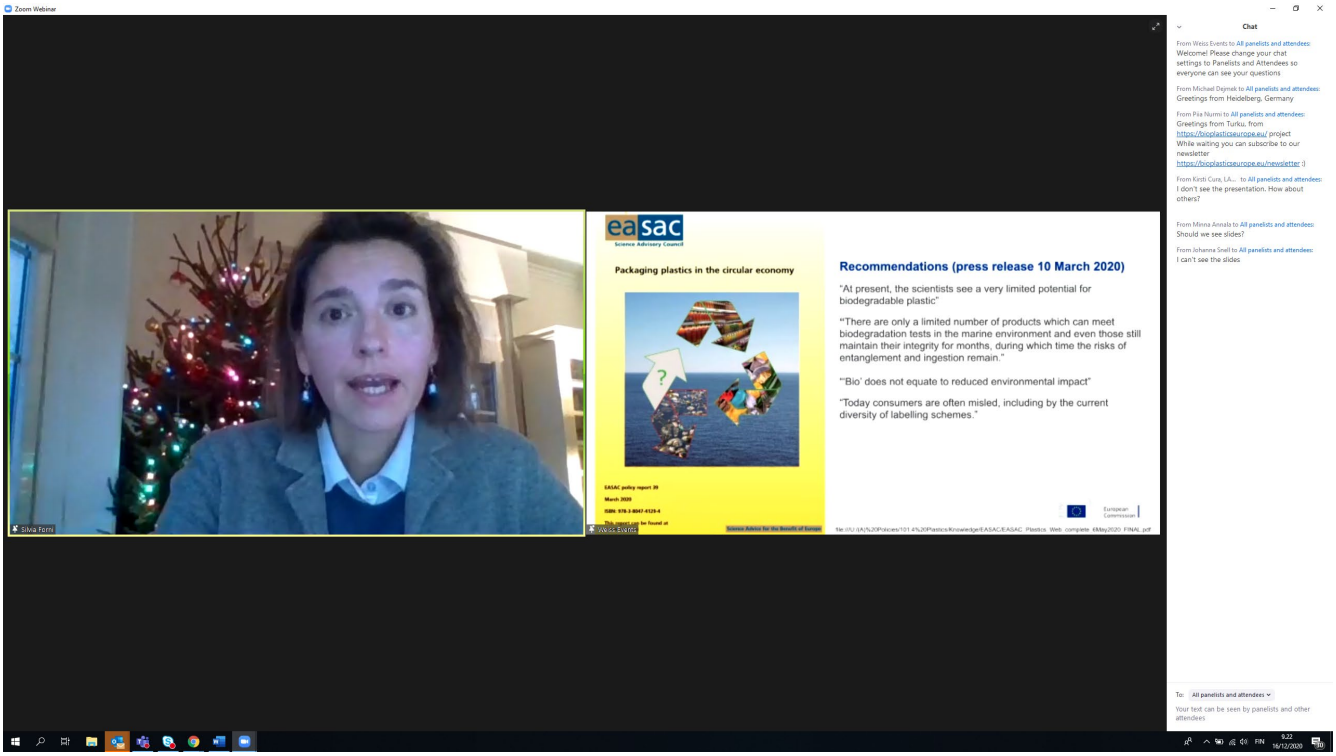
Strategy Adapted in 2018

Four pillars in EU strategy in circular economy.

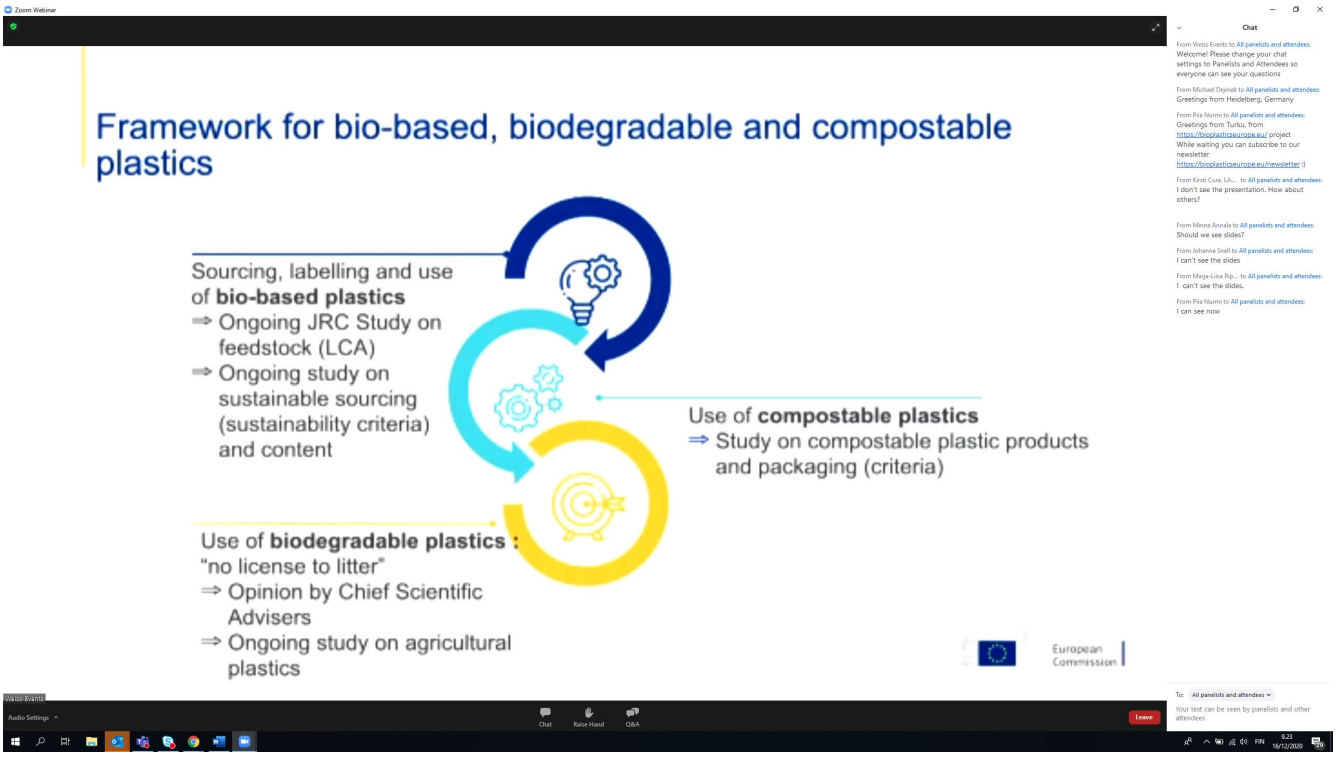
New circular economy action plan.



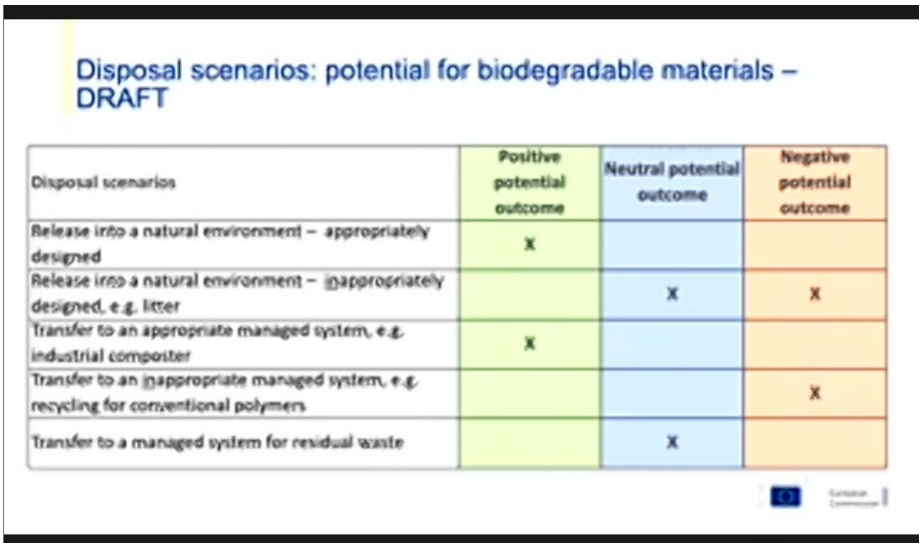
Use bio-based compostable or biodegradable. Bioplastic is too general and covers too many things.



Report made by scientists, not EU on packaging



Framework expected end of this year



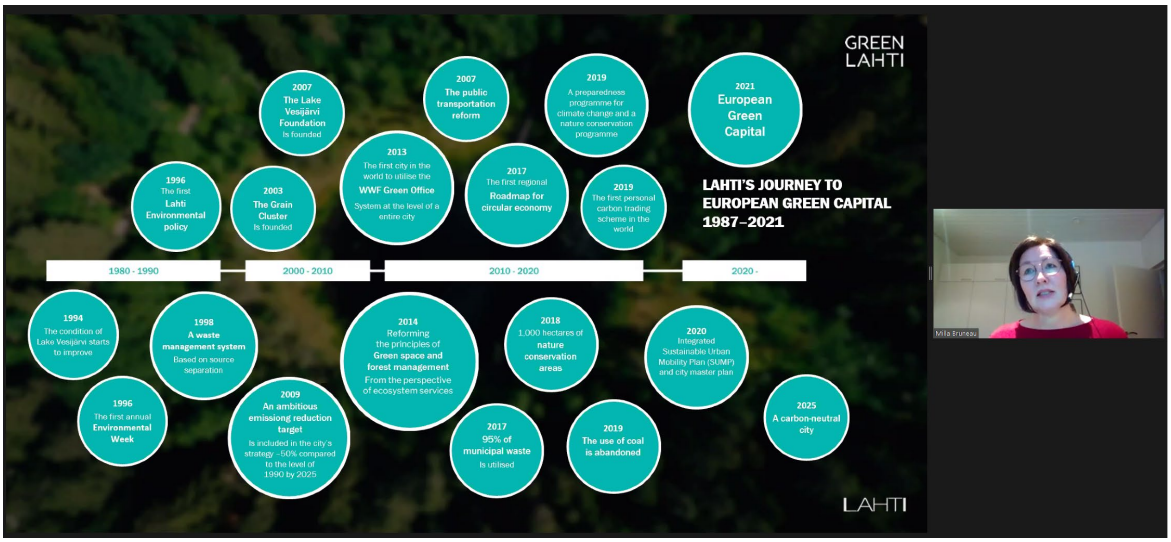
Industry waiting for definition of plastics. Currently waiting for guidance from the EC.

Request for single use products instead of single use plastics.->EC view based on study

9.45 Green Lahti – European Green Capital 2021, Milla Bruneau

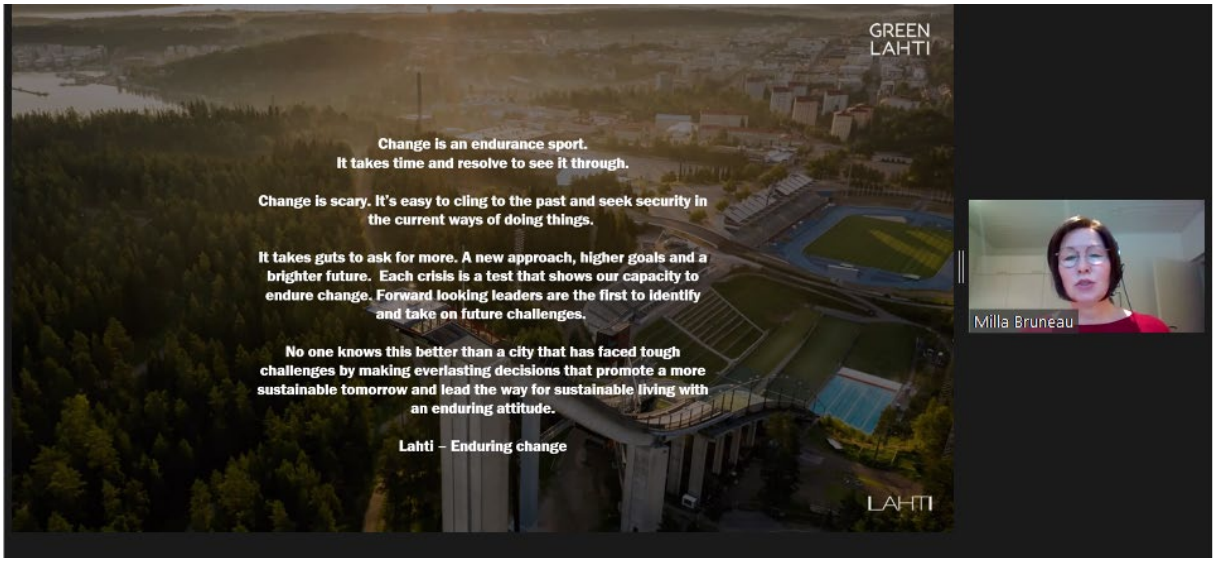
This event is part of European green capital project


GREEN LAHTI
AN ANNUAL COMPETITION ORGANISED BY THE EUROPEAN COMMISSION:
Applicants for the European Green Capital Award 2021 were assessed on their performance in 12 key environmental indicators:
1. Climate change: Mitigation
2. Climate change: Adaptation
3. Sustainable urban mobility
4. Sustainable land use
5. Nature and biodiversity
6. Air quality
7. Noise
8. Waste
9. Water
10. Green growth and eco-innovation
11. Energy performance
12. Governance
Lahti's application : greenlahti.fi/facts
LAHTI
Milla Bruneau

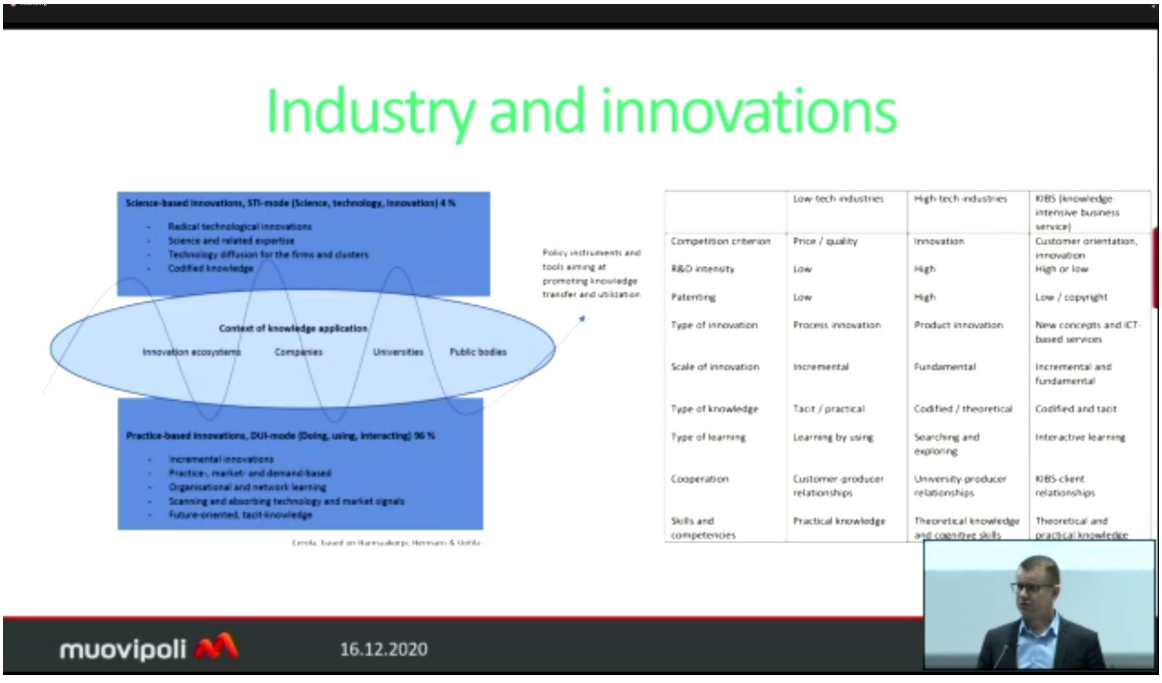

GREEN LAHTI
LAHTI'S JOURNEY TO EUROPEAN GREEN CAPITAL 1987–2021
1980 - 1990
2000 - 2010
2010 - 2020
2020 -
1996 The first Lahti Environmental policy
2003 The Grain Cluster is founded
2007 The Lake Vesijärvi Foundation is founded
2013 The first city in the world to utilise the WWF Green Office System at the level of a entire city
2007 The public transportation reform
2017 The first regional Roadmap for circular economy
2019 A preparedness programme for climate change and a nature conservation programme
2019 The first personal carbon trading scheme in the world
2021 European Green Capital
1994 The condition of Lake Vesijärvi starts to improve
1998 A waste management system Based on source separation
1996 The first annual Environmental Week
2009 An ambitious emissiong reduction target is included in the city's strategy -50% compared to the level of 1990 by 2025
2014 Reforming the principles of Green space and forest management From the perspective of ecosystem services
2017 95% of municipal waste is utilised
2018 1,000 hectares of nature conservation areas
2019 The use of coal is abandoned
2020 Integrated Sustainable Urban Mobility Plan (SUMP) and city master plan
2025 A carbon-neutral city
LAHTI
Milla Bruneau


GREEN LAHTI
GREEN CAPITAL YEAR 2021 THEMES
CARBON-NEUTRAL LIFE
CITIZEN PARTICIPATION
CIRCULAR ECONOMY
NATURE AND WATER
LAHTI
Milla Bruneau

Sustainable Lahti foundation established this year by Lahti and surrounding municipalities. Funds local projects



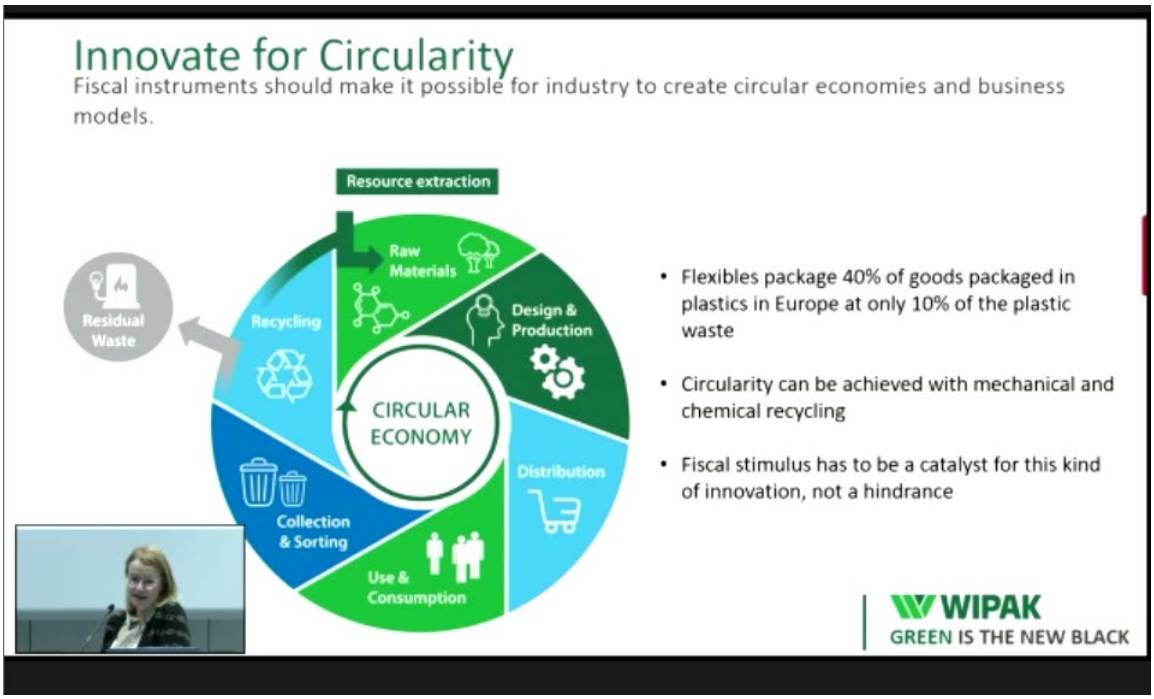
10.30 Boosting bioplastic innovations, Sauli Eerola, Muovipoli Oy

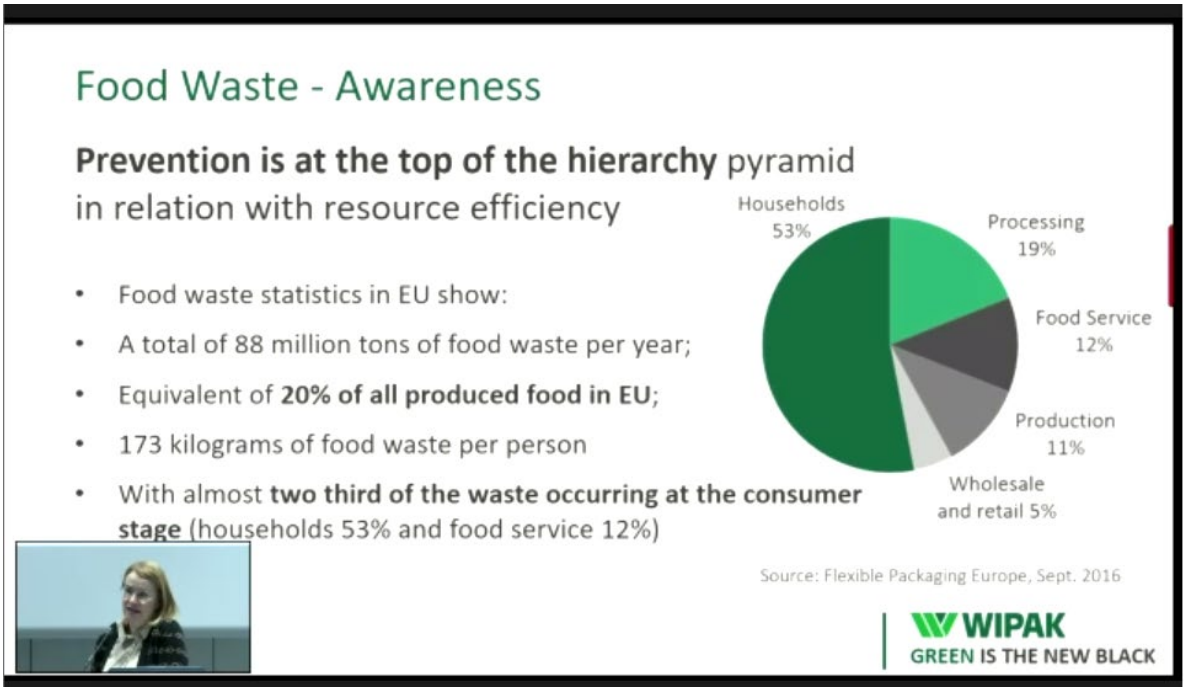


Recently published a plastics guide with Finnish plastics industry federation.

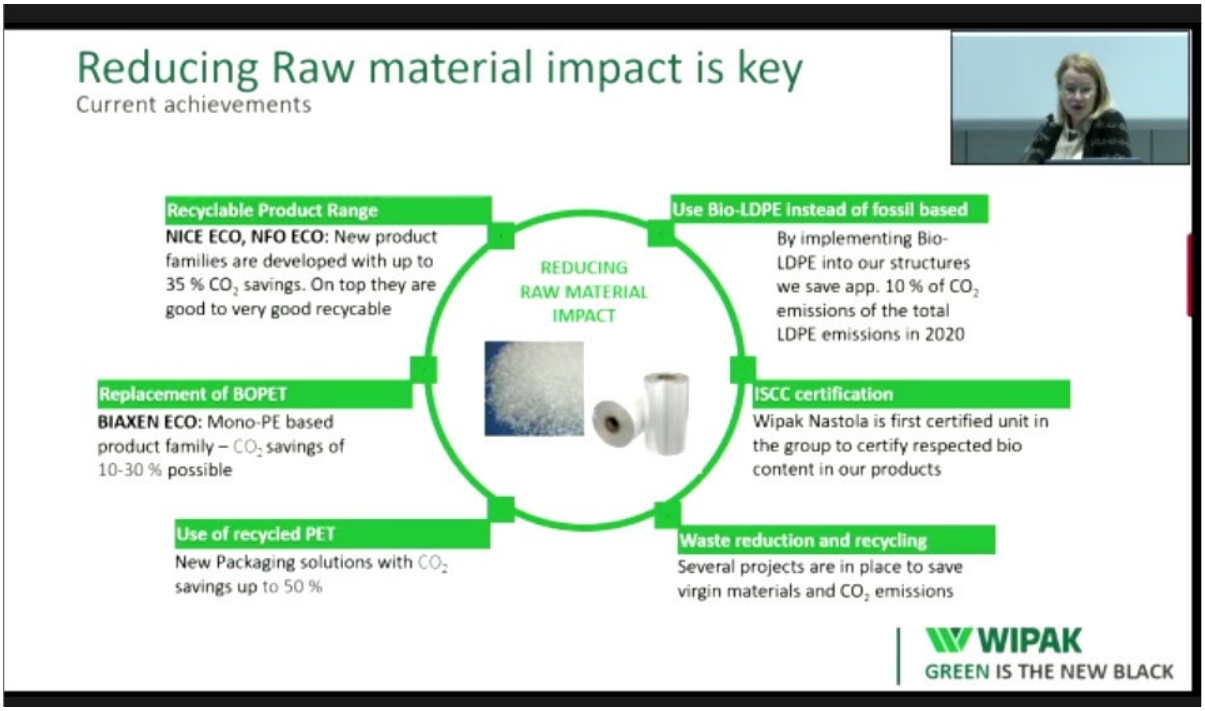
10.50 Carbon neutral plastics in packaging industry, Tuija Suur-Hamari, Wipak Oy

Flexible packaging company, working in food and health packaging





Their aim: prevent food waste whilst being carbon neutral (Corporate Carbon Footprint Carbon Zero-Z focus on raw materials). Now working with replacement raw materials, e.g. using recycled and bio-based materials. Cost of changed is passed to end consumer. Will still need market acceptance for the new products. Have an app oto show customers the benefits of changing to more sustainable solutions



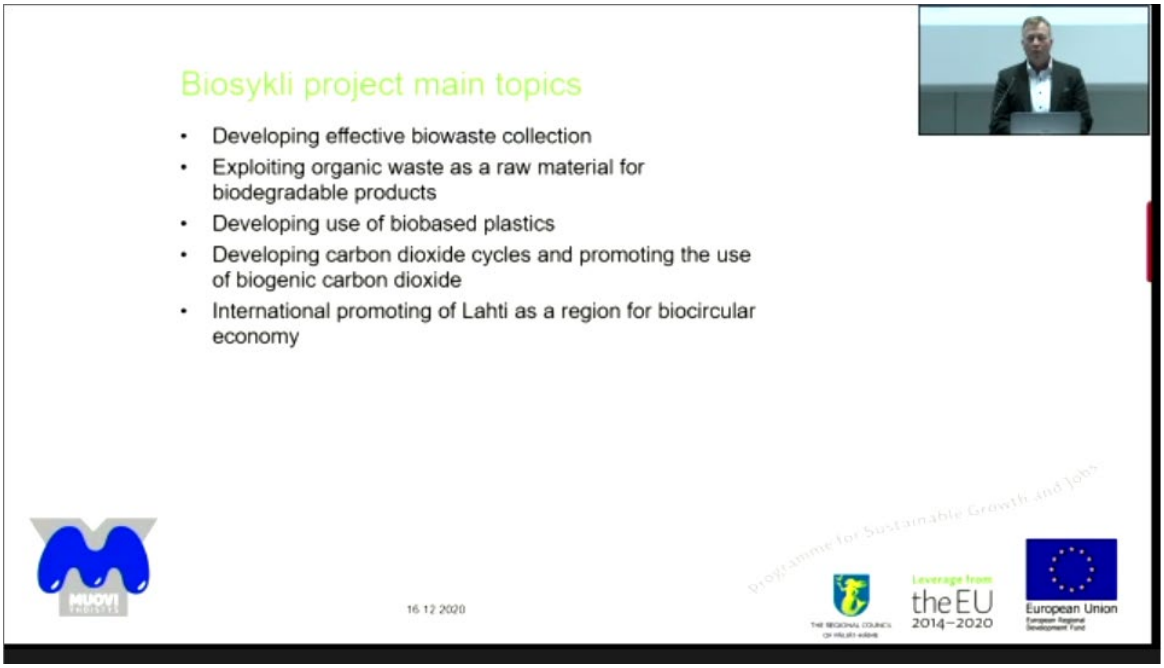
11.10 Case Wiitta, Wille Viittanen, Wiitta Oy

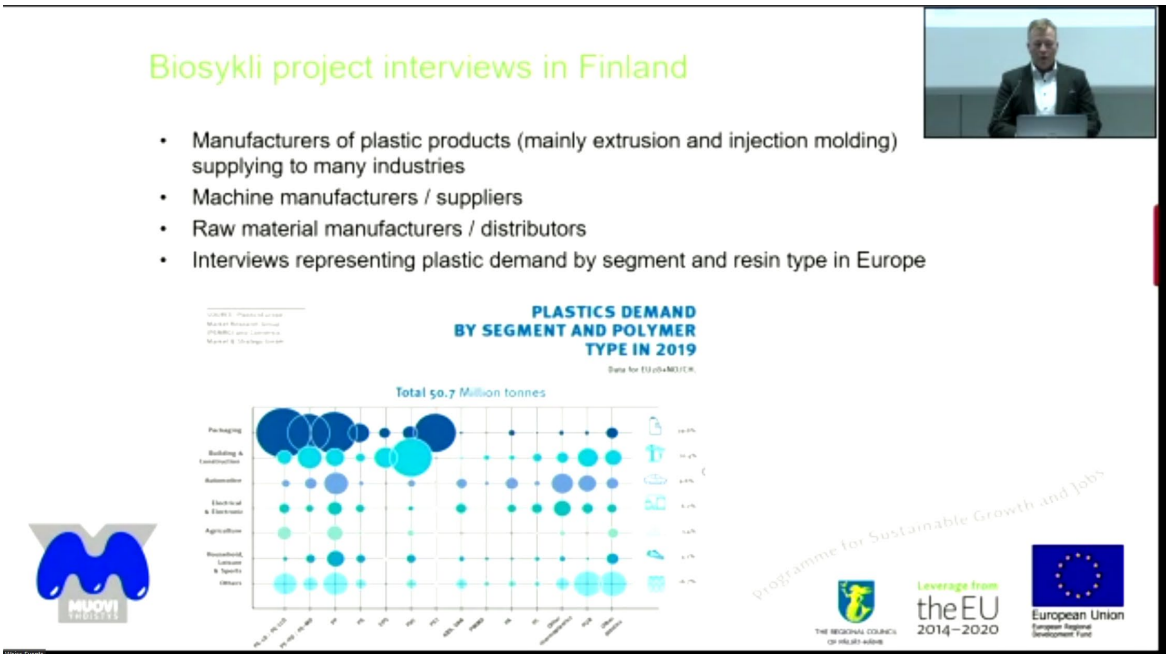
Company focusing on injection moulding. Looking at the problems (including limits) and benefits of different materials.

In Finland the future is based on wood.

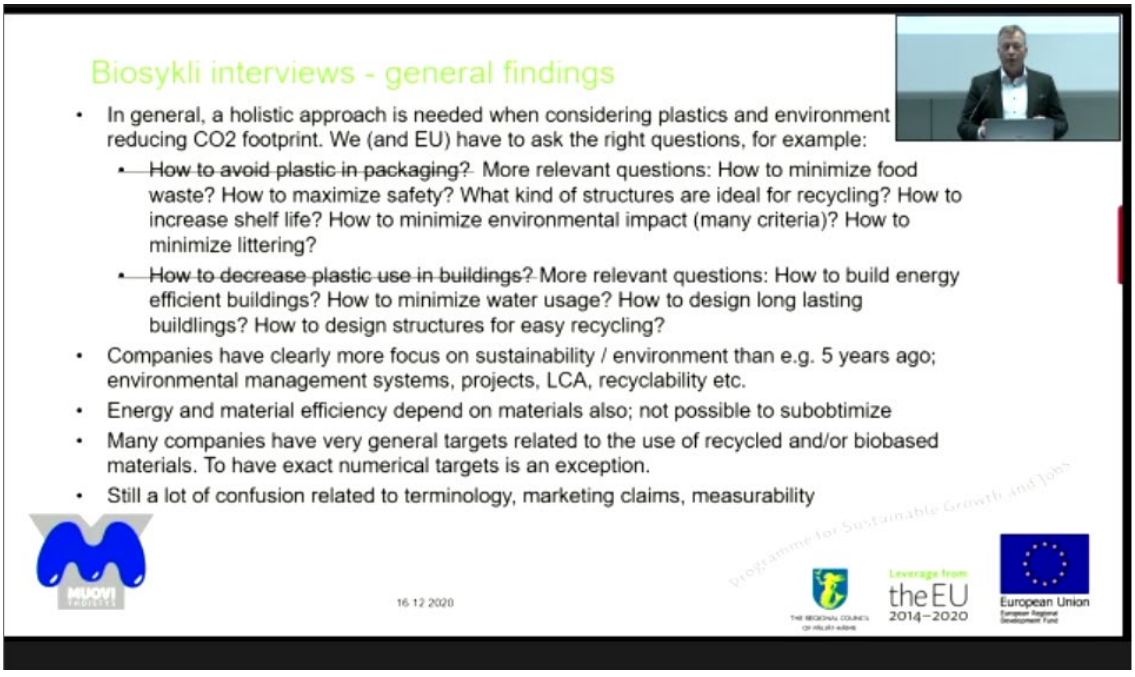
Not all products are suitable to use biodegradable material, e.g. pipes

11.45 Biosykli – Circular Bioeconomy in Lahti Region, Vesa Taitto, The Finnish Plastics Association

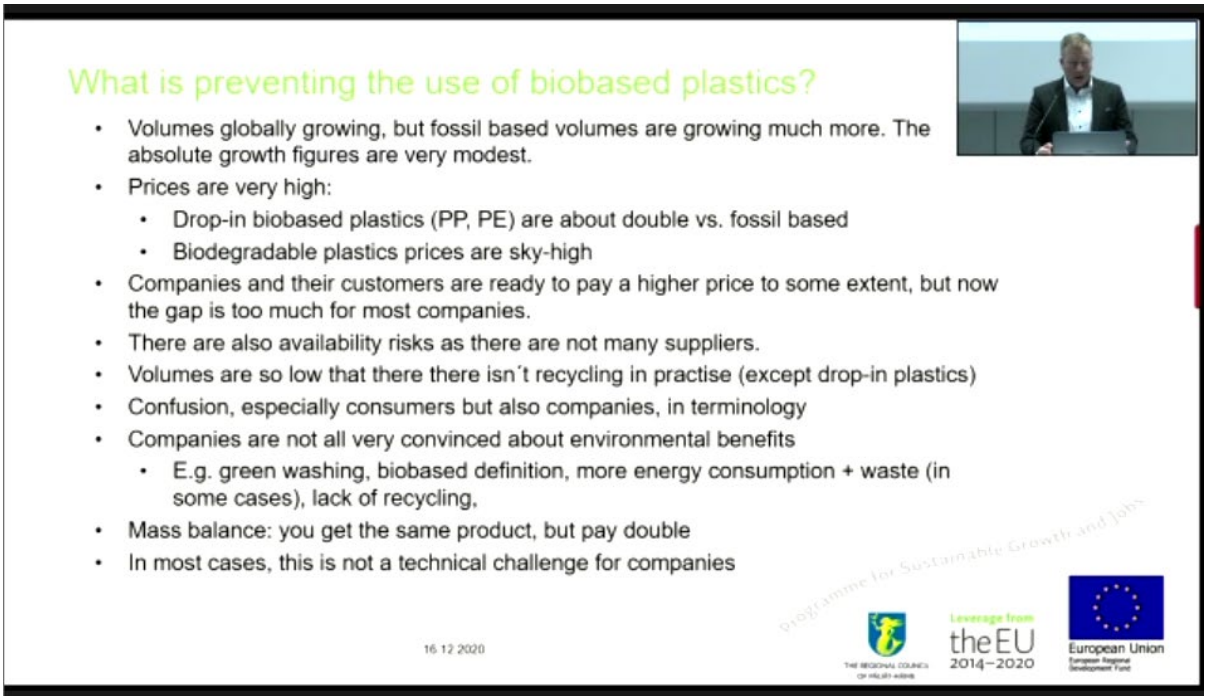




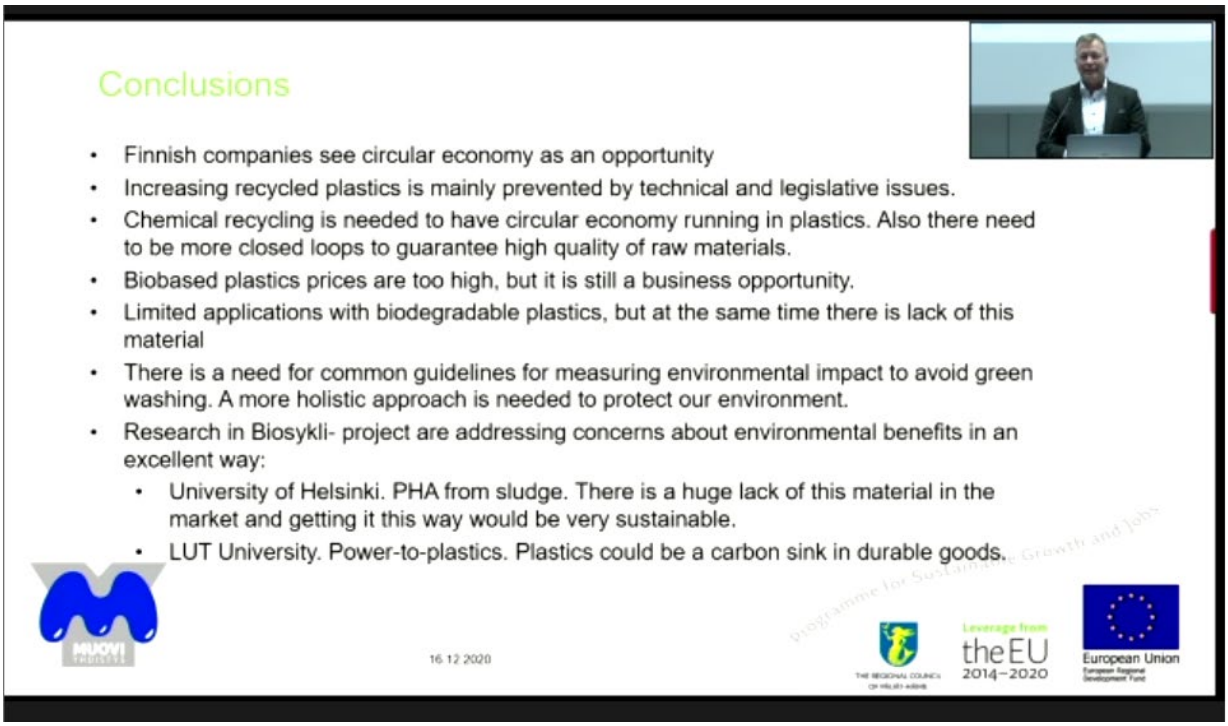
Interview findings:



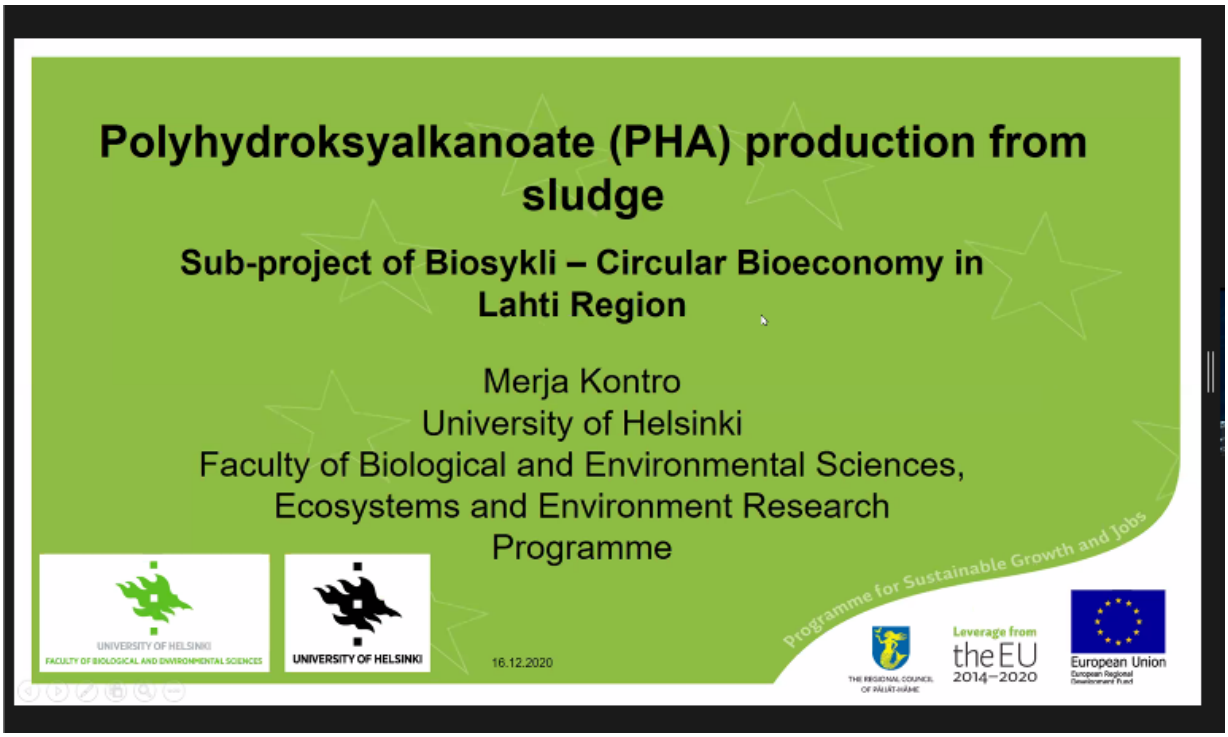
We need more common standards

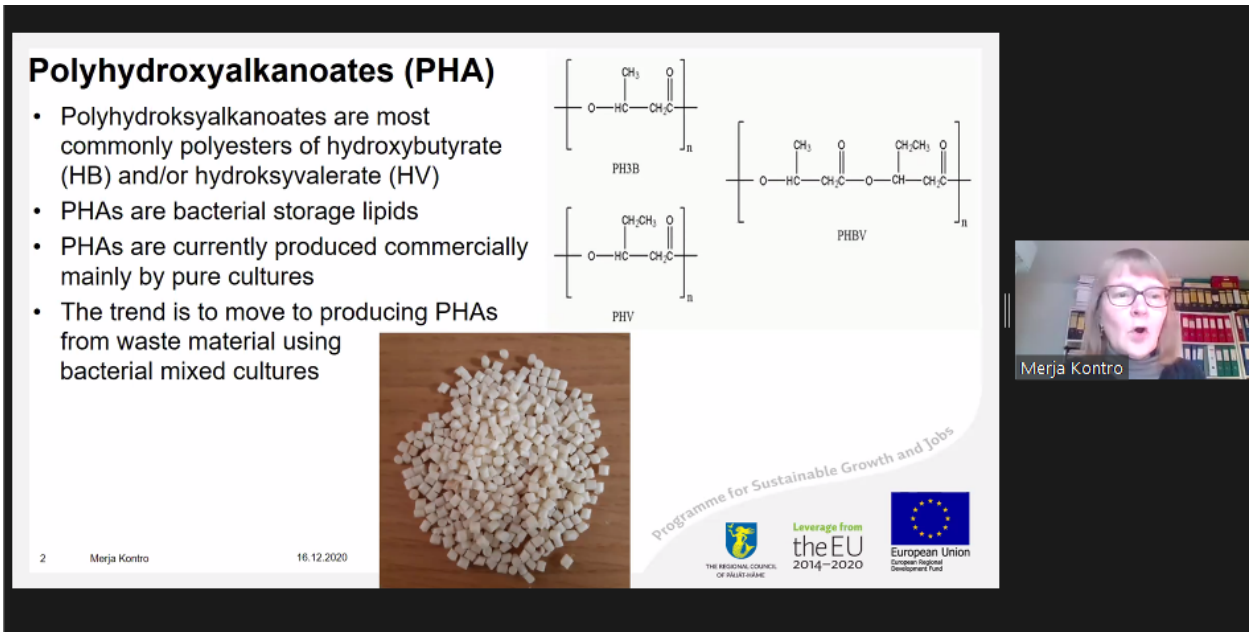


Environmental benefit is contradictory



12.00 PHA production from sludge, Merja Kontro, University of Helsinki





Tend to be produced from sugars. Nor there is a move to produce it from other materials. In their case, they are studying sludge. Look not only at production method as also whether it is economically viable

12.20 Power to plastics, Ville Uusitalo, LUT University

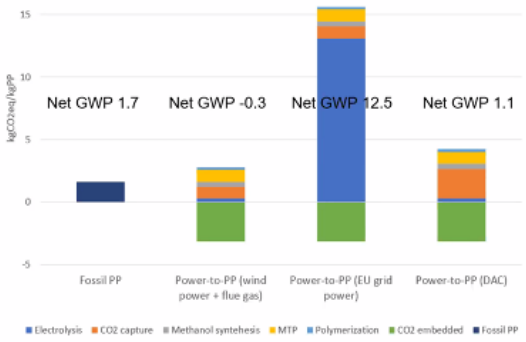
Looking at a new way of making plastics, based on electricity. Using excess electricity produced through renewable methods. Use electrolysis.

Carbon capture

MATERIALS, METHODS AND ASSUMPTIONS

- A Life cycle assessment model was created using the GaBi software to assess global warming potential (GWP) of power-to-polypropylene (PP)
- Initial data is based on literature and GaBi databases
- Functional unit is 1 kg polypropylene
- Basic assumptions:
  - Electricity for electolysis is produced by wind power
  - PEM electrolyzer is utilized to produce hydrogen
  - CO_2 is captured from flue gas flow using amine technology
  - Methanol conversion is modelled based on previous simulations
  - Propylene is produced by MTP process

GWP OF POWER-TO-PP



(Kuusela, K., Uusitalo, V., Ahola, J., Levänen, J. 2020. Not yet published, in a review process)

CONCLUSIONS

- It could be possible to produce polypropylene with negative global warming impacts if:
  - Electrolysis is based on renewable electricity
  - Waste CO_2 is captured from flue gas
- This could provide a carbon sink if plastic is used in long lasting solutions
- From LCA methodological perspective it is not clear how CO_2 from flue gas flow should be considered e.g. between power plant and plastic producer
- There can be additonal possibilities to reduce GWP of power-to-plastics e.g. by heat integrations
- There are still open questions related to future feasibility and technical implementation of required processes and to their integration especially methanol conversion
- Power-to-plastics does not solve end-of-life challenges related to plastics
- Power-to-plastics provides an interesting option to reduce climate impacts of plastic industry

Chat

From Britta Haahti to All panelists and attendees:
So, it is possible to produce a plastics subsitute (or bioplastics) from sludge?!! Sounds fantastic!

From Vesa Taitto, ... to All panelists and attendees:
To Erkki. Please see the presentations from University of Helsinki and LUT University. Both could be real global solutions in the long run.

From Britta Haahti to All panelists and attendees:
Is this a innovative new way of producing this end product, alrady used by industry, or are we talking about a totally new product?
Thank you Merja for your answer!

From Sauli Eerola to All panelists and attendees:
Yes!

From Jenni Syvänn... to All panelists and attendees:
Questions to Ville?

From Vesa Kärhä to All panelists and attendees:
What kind of PHB capacity/production do you expect from the 1000l batch. Was is Q&A sectiosn. Anybody , numbers?

From Jenni Syvänn... to All panelists and attendees:
Merja Kontro 12:22 PM
In high organics bioreactor, about half of organics is transformed to PHAs (about 40-50%), some less in high inorganics bioreactor; in case of sludge-based materal.

From Werner Merz... to All panelists and attendees:
What is the efficiency rate for this process?

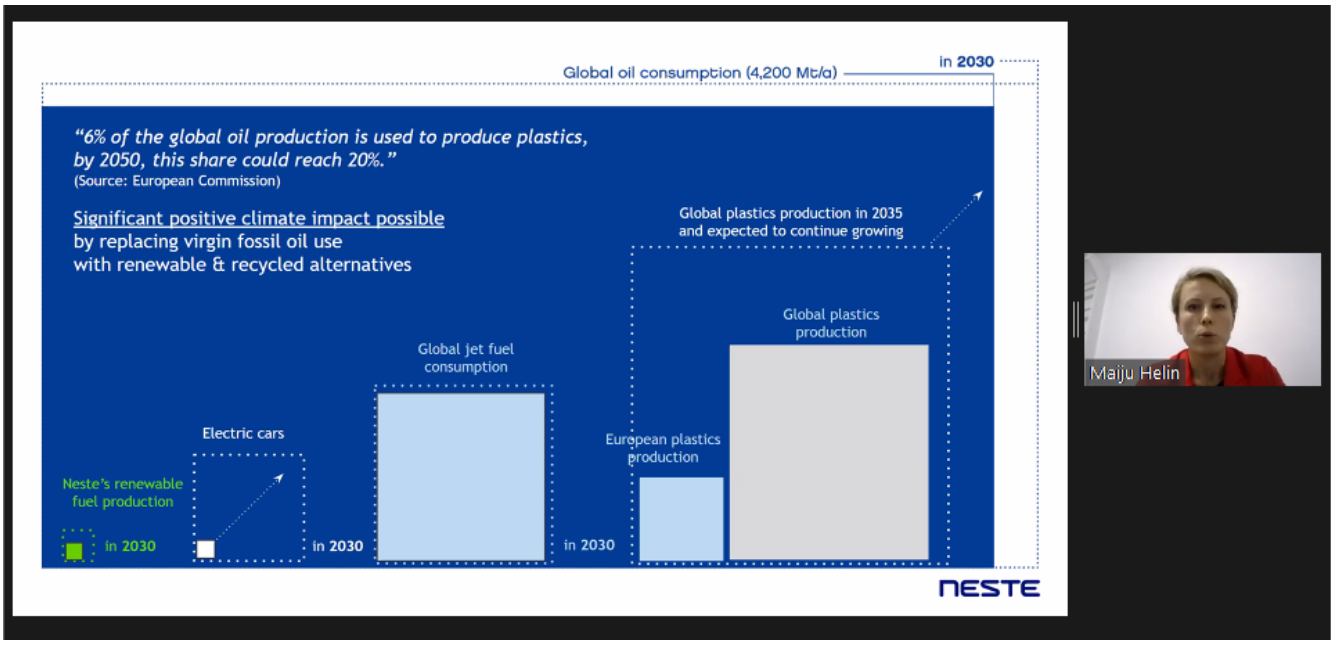
From Vesa Taitto, ... to All panelists and attendees:
Potential is unlimited because only in the area of Lahti, you could get (theoretically) thousands of tons annually

From Vesa Kärhä to All panelists and attendees:
Plastics as CCS route ! Great.

From Merja Kontro to All panelists and attendees:
It is most likely that we need several/all different alternatives, one cannot solve all problems. All different carbon sources should be utilized, and the economics of different carbon sources utilization also vary. The need for recycled carbon is huge if we are aiming to replase all fossil fuel based plastics with biobased/recycled carbon sources. Then carbon is also needed for other purposes than plastics. In couse of time we will get to know which approace is the best one and in which situation. In case of wastewater sludge, there is 2/3 organic material, and currently it is difficult to utilize, cannot be used in agriculture.

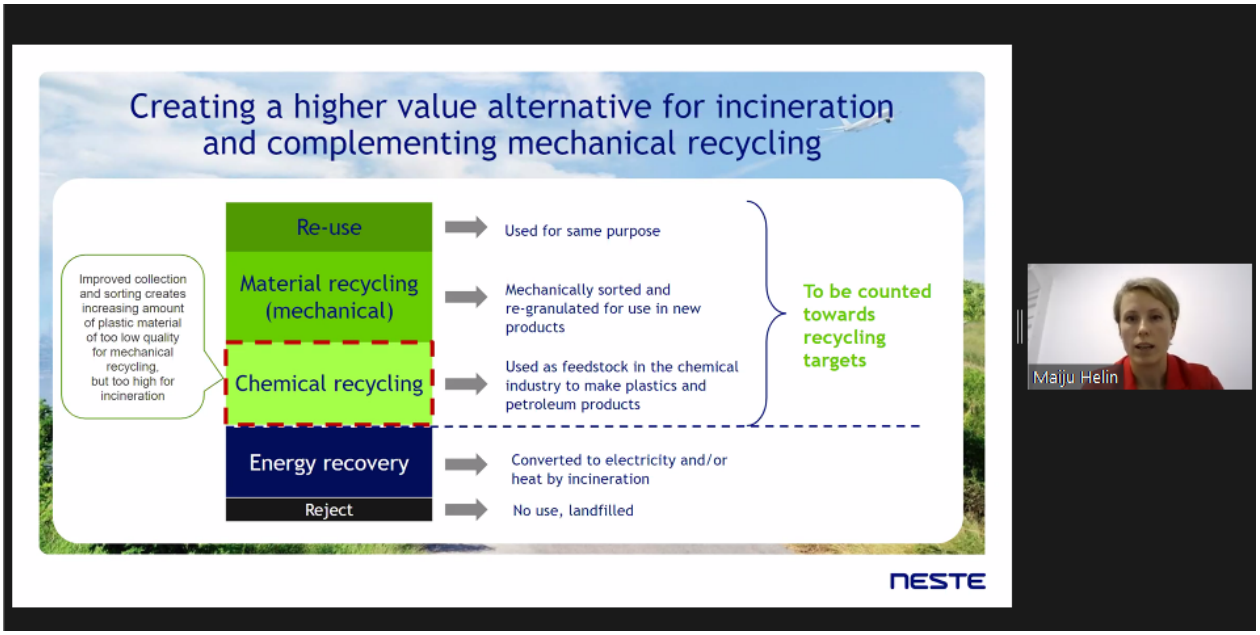
To: All panelists and attendees

13.15 Neste's approach to renewable and circular carbon solutions, Maiju Helin, Neste Oyj



Green: Neste

Others: global

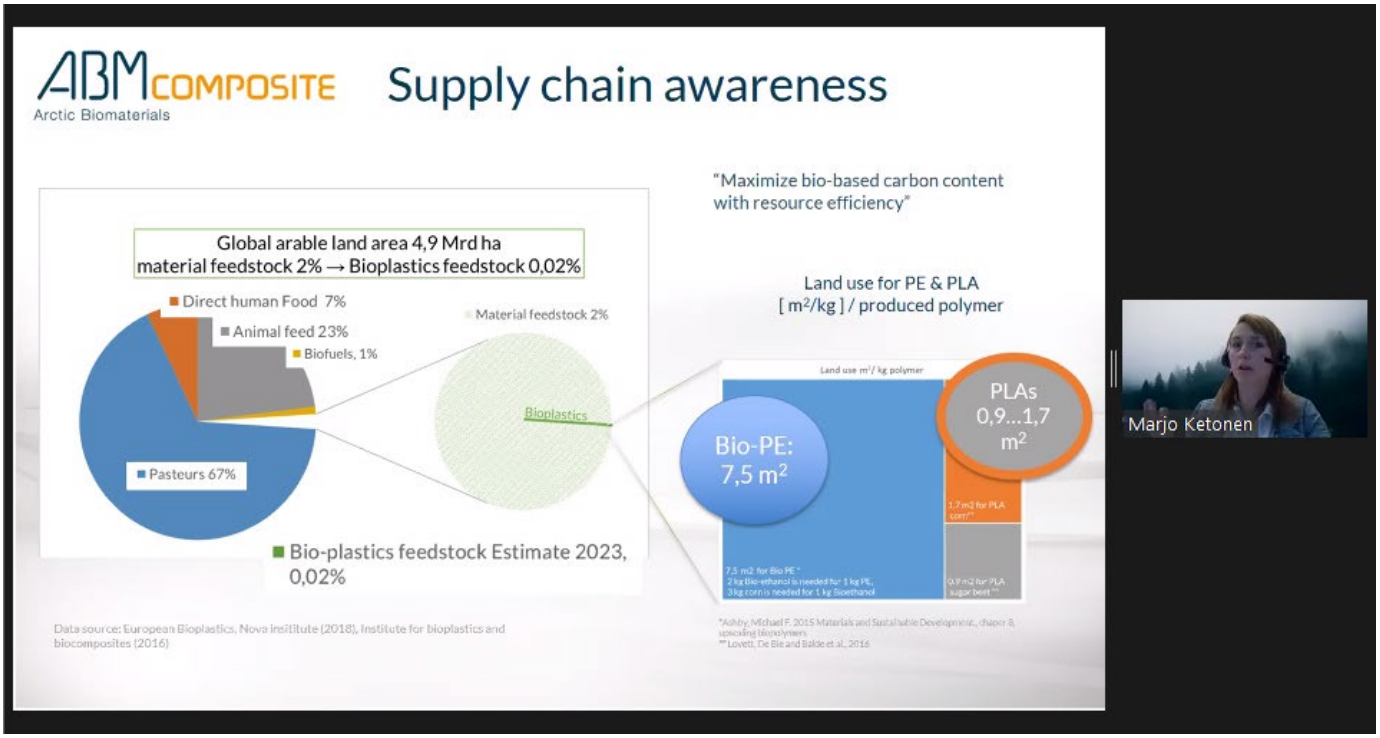


New layer of recycling. Focus is on chemical recycling.

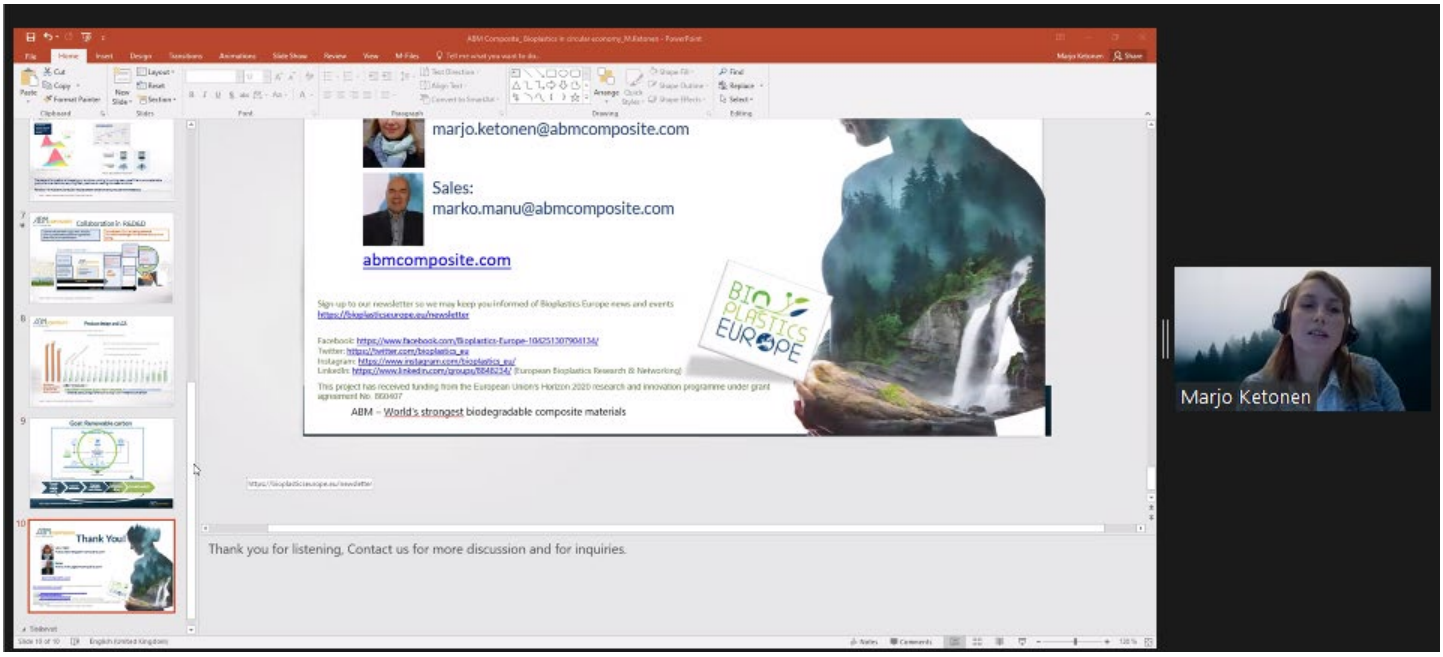
Phasing out palm oil.

13.45 Biobased plastics in circular economy, Anna Fråne, IVL Swedish Environmental Research Institute & Marjo Ketonen, Arctic Biomaterials Oy

They produce raw materials as a sustainable products

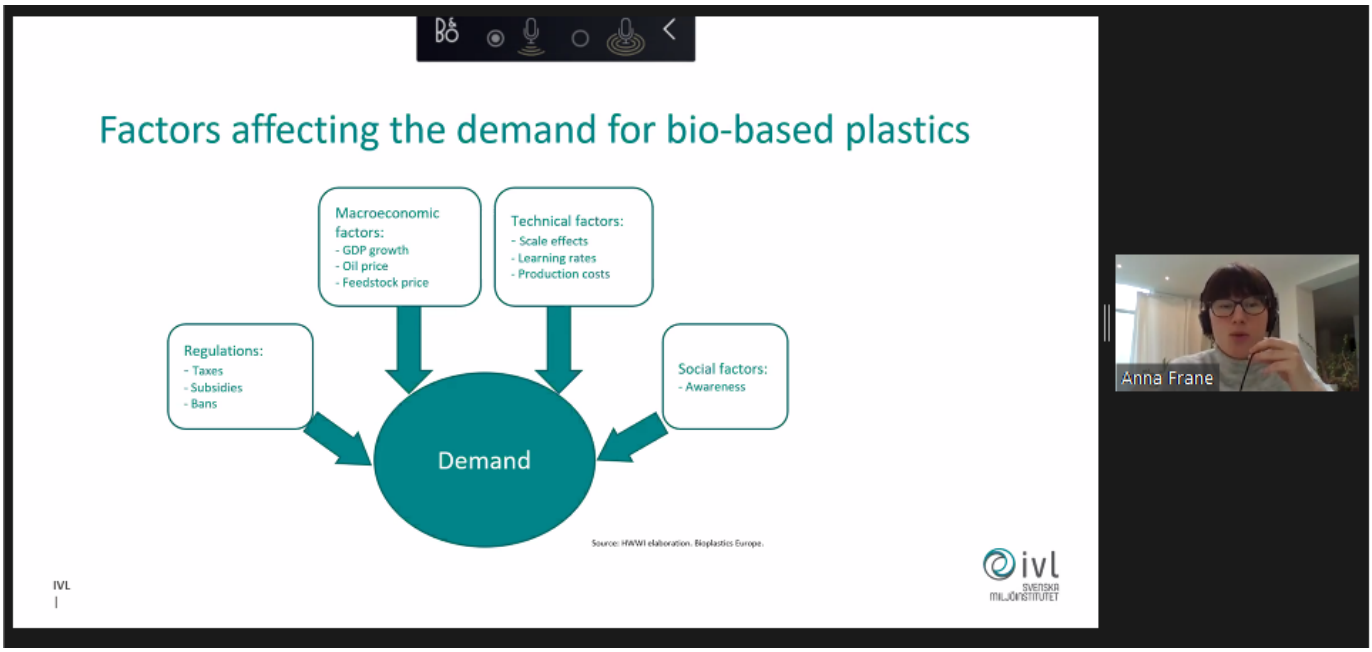


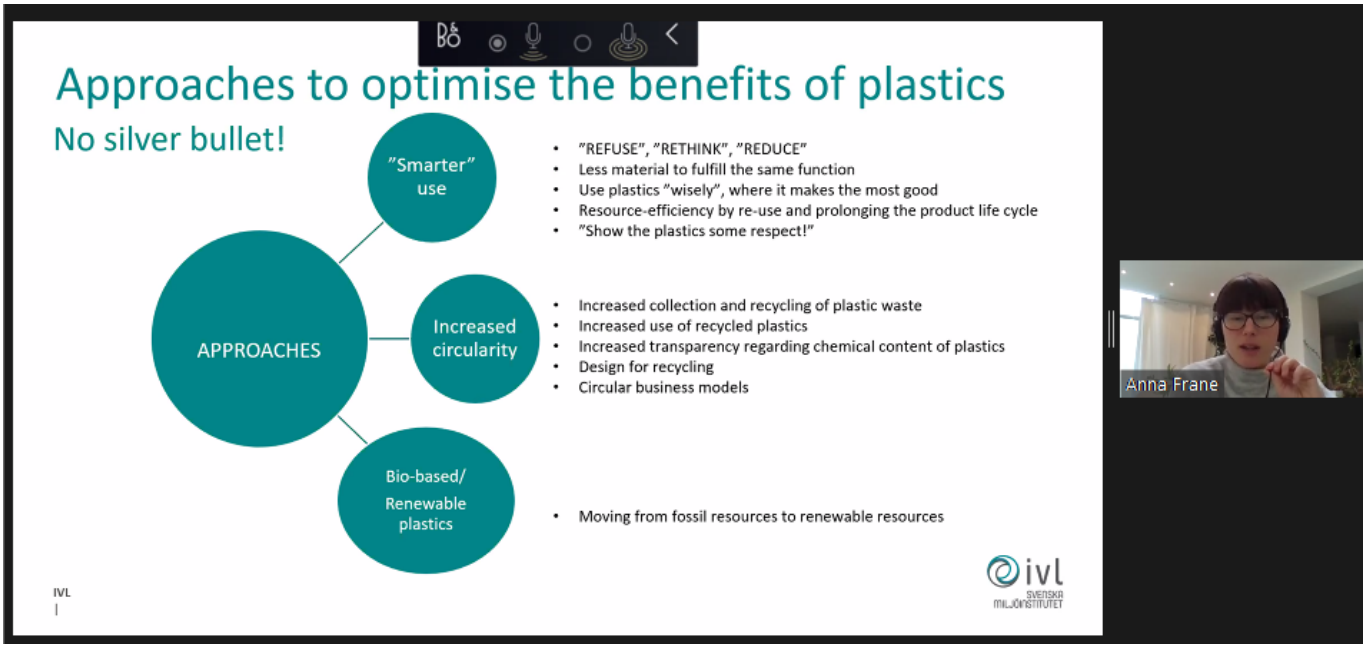
e.g. corn requires more land than PLA production



Bio based products are more expensive and it is important that customers can use them in economic terms, not working with cellulose based, working with fiber glass

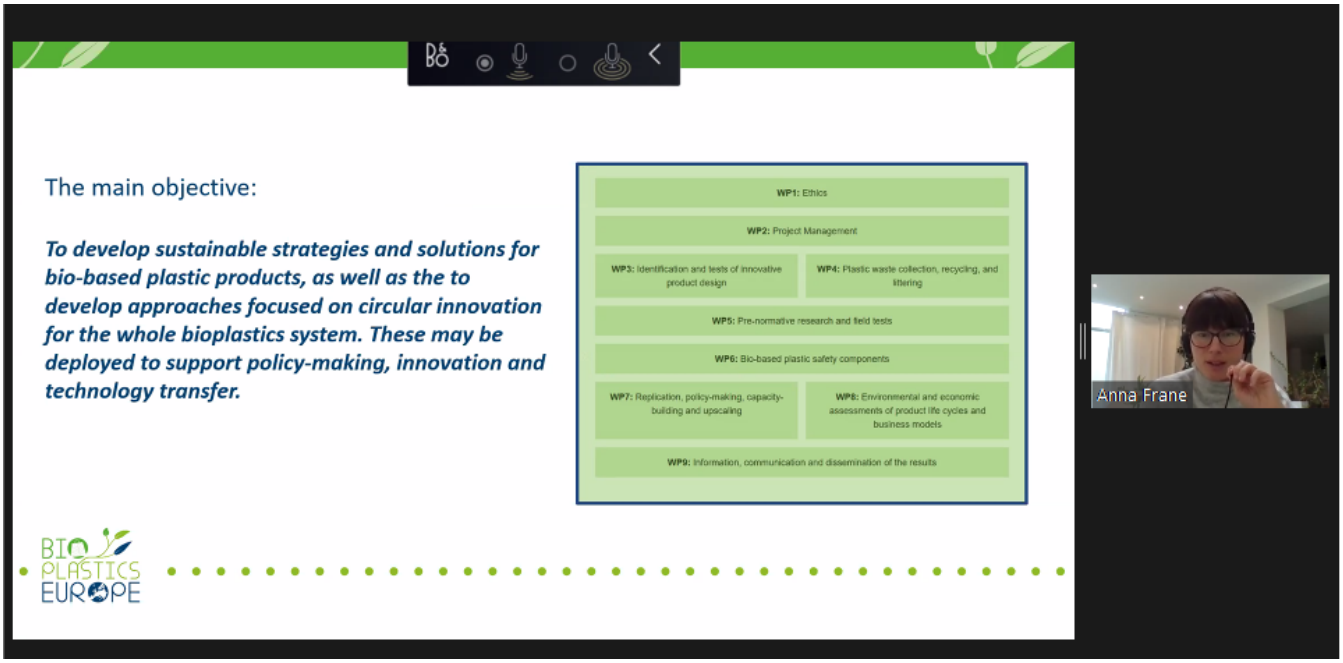
Focus on plastic waste

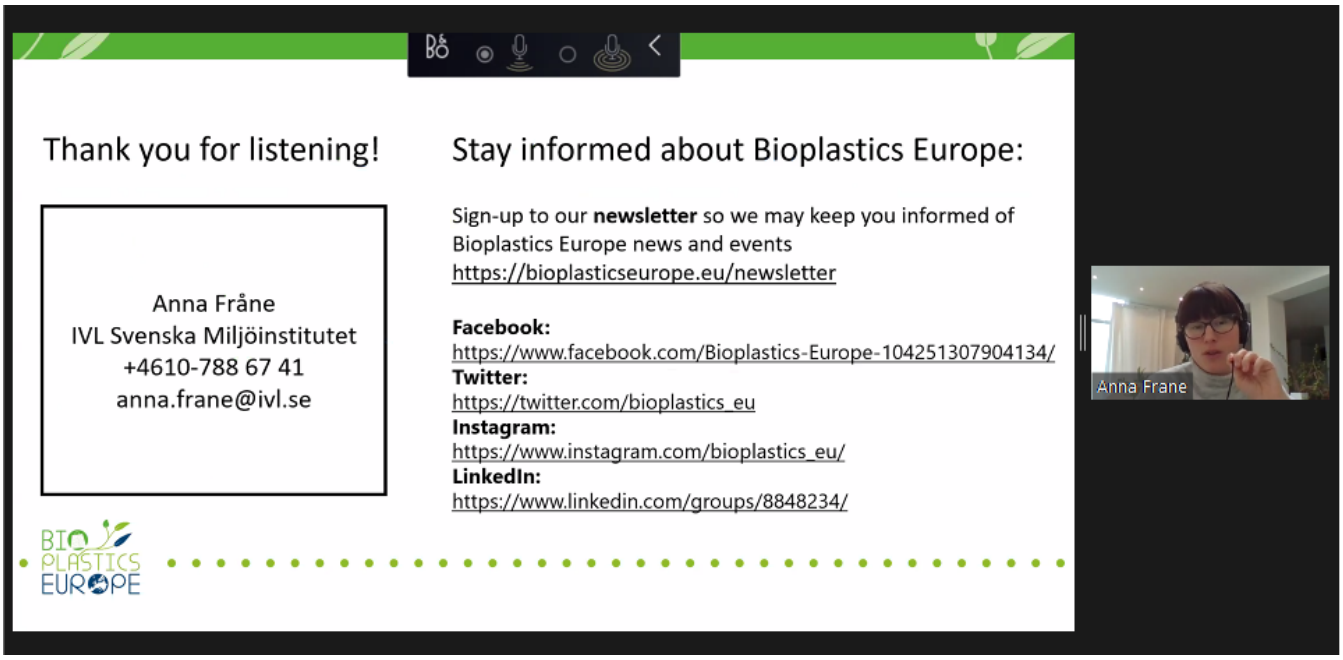




You must always think about the end of life options


BIO-PLASTICS EUROPE
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 860407.
BIO-PLASTICS EUROPE project website: www.bioplasticseurope.eu
Anna Frane


The main objective:
To develop sustainable strategies and solutions for bio-based plastic products, as well as the to develop approaches focused on circular innovation for the whole bioplastics system. These may be deployed to support policy-making, innovation and technology transfer.
WP1: Ethics
WP2: Project Management
WP3: Identification and tests of innovative product design
WP4: Plastic waste collection, recycling, and littering
WP5: Pre-normative research and field tests
WP6: Bio-based plastic safety components
WP7: Replication, policy-making, capacity-building and upscaling
WP8: Environmental and economic assessments of product life cycles and business models
WP9: Information, communication and dissemination of the results
Anna Frane



14.15 Closing remarks