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The Päijät-Häme Waste Management strategy and the process from separate collection of biowaste to treatment in a biogas and composting plant

Susanna Vanhamäki

RDI Manager, BIOREGIO Project Coordinator

LAB University of Applied Sciences, Finland

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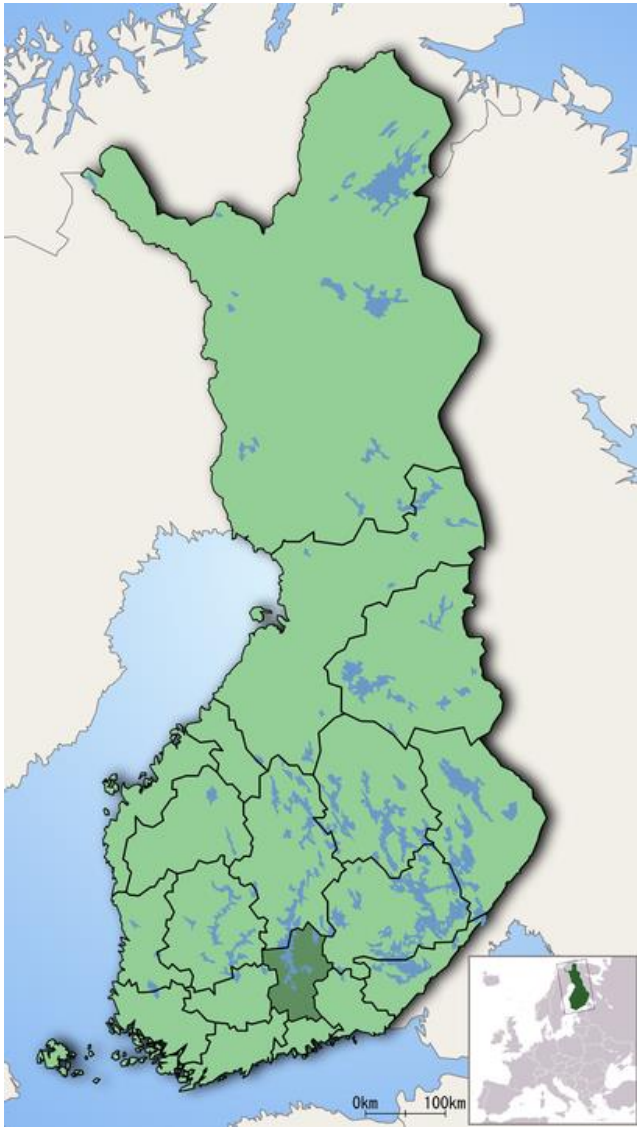
Regional circular economy models and best available technologies for biological streams

Good practice:
‘Utilisation of biowaste streams - bio-based industrial symbiosis’

- **One of the 43 good practices identified in BIOREGIO, of which 34 are approved to the policy learning platform**

Päijät-Häme Waste Management Ltd (PHJ)



- Founded in 1993, 10 owner municipalities, City of Lahti as the biggest
- 202,000 residents + summer residents
- 21,000 holiday homes
- 13,000 businesses (incl. farms)
- Kujala Waste Centre is the main site of PHJ and its only waste treatment site
  - waste from communities and production facilities for interim storage, handling, recovery, transfer and final disposal
  - Kujala completed in 2001, the site covers 70 hectares

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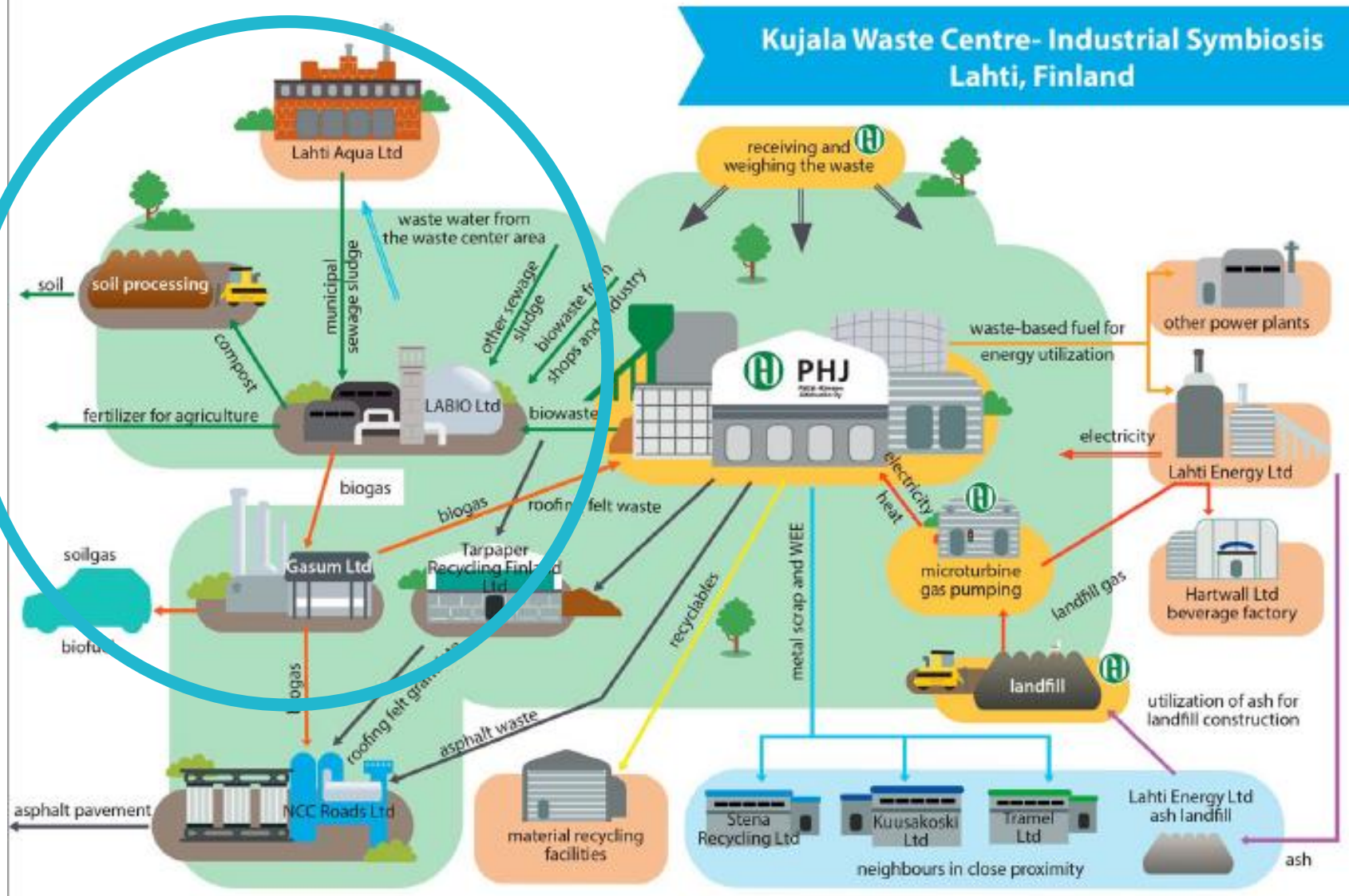
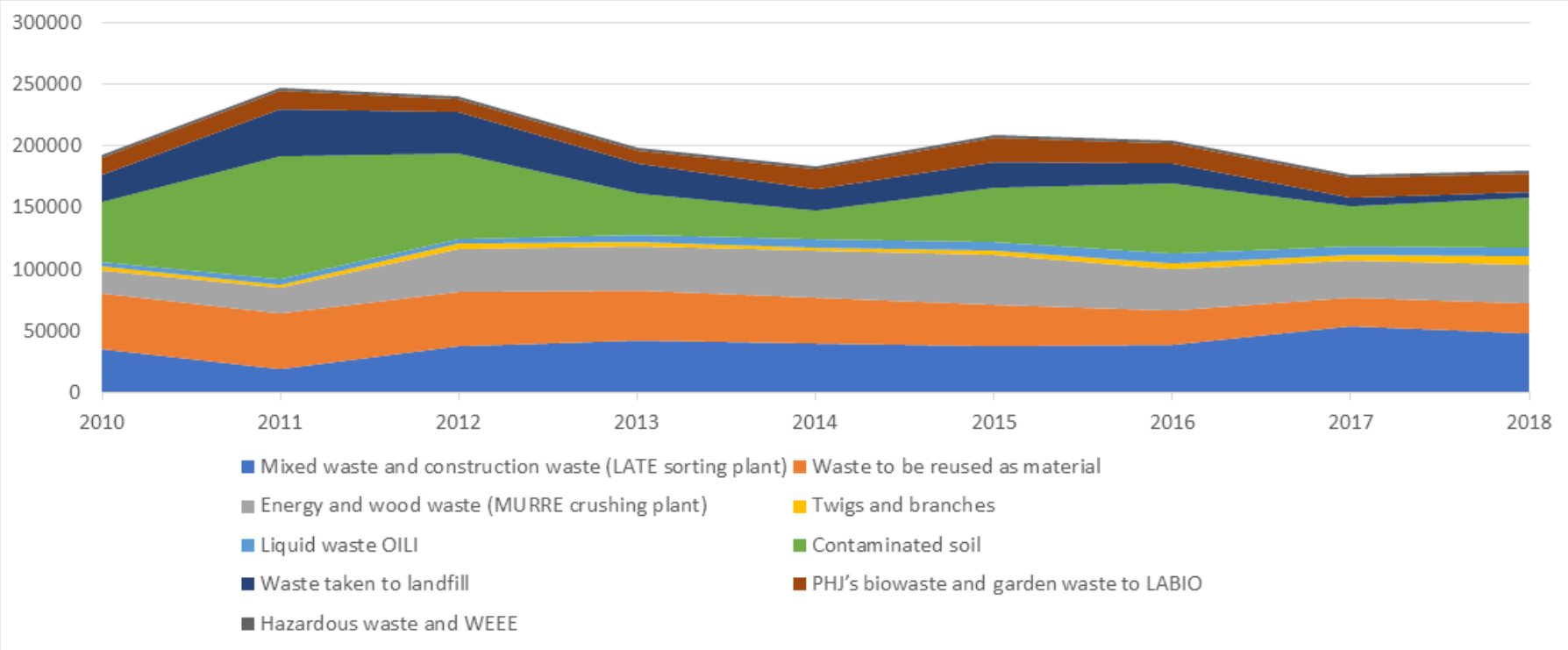
Industrial symbiosis



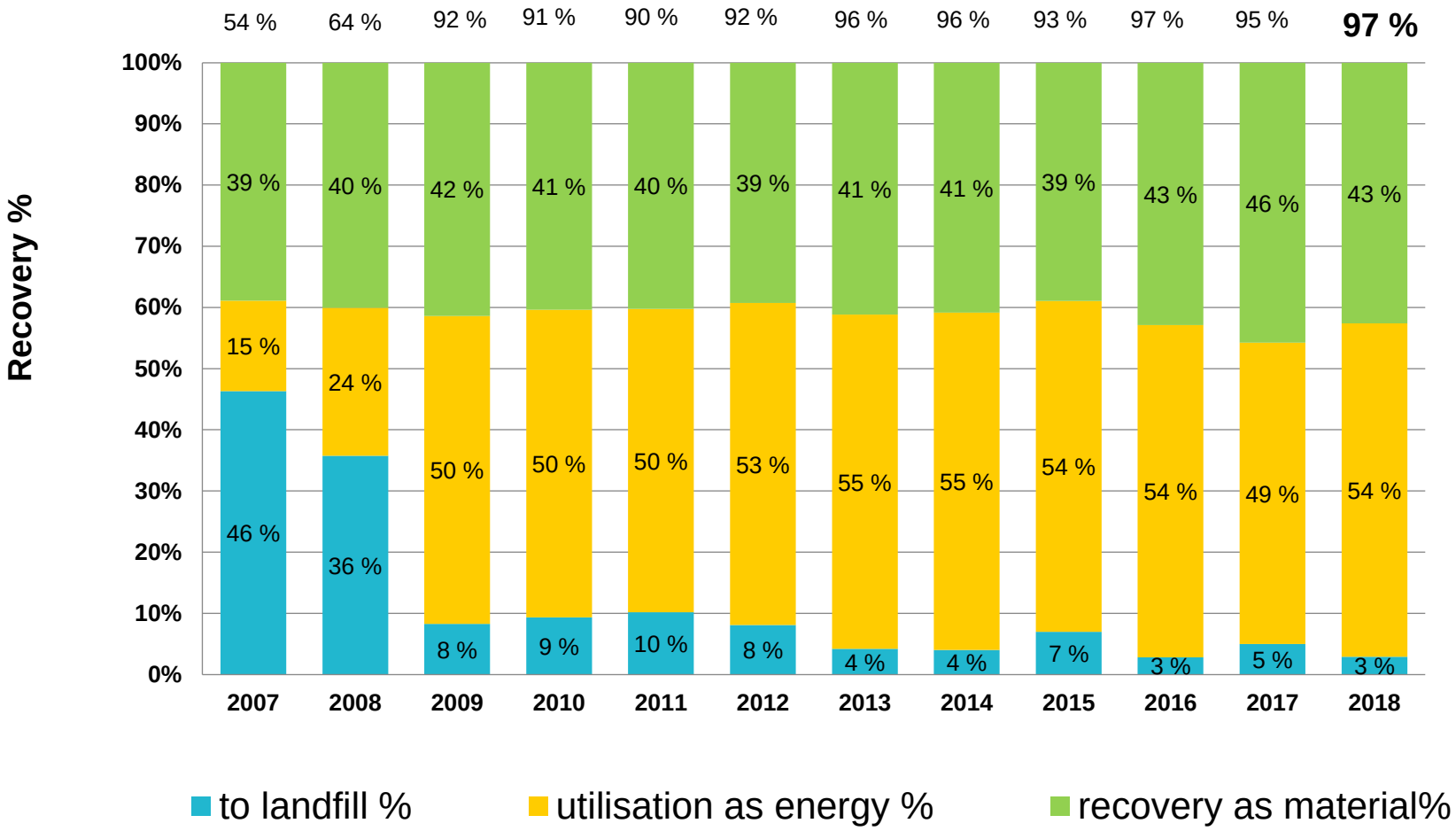
Boosted by LADEC Designed Anna Polkutie in collaboration with Esa Ekholm and Hanna Bergman

Waste received by Päijät-Häme Waste Management

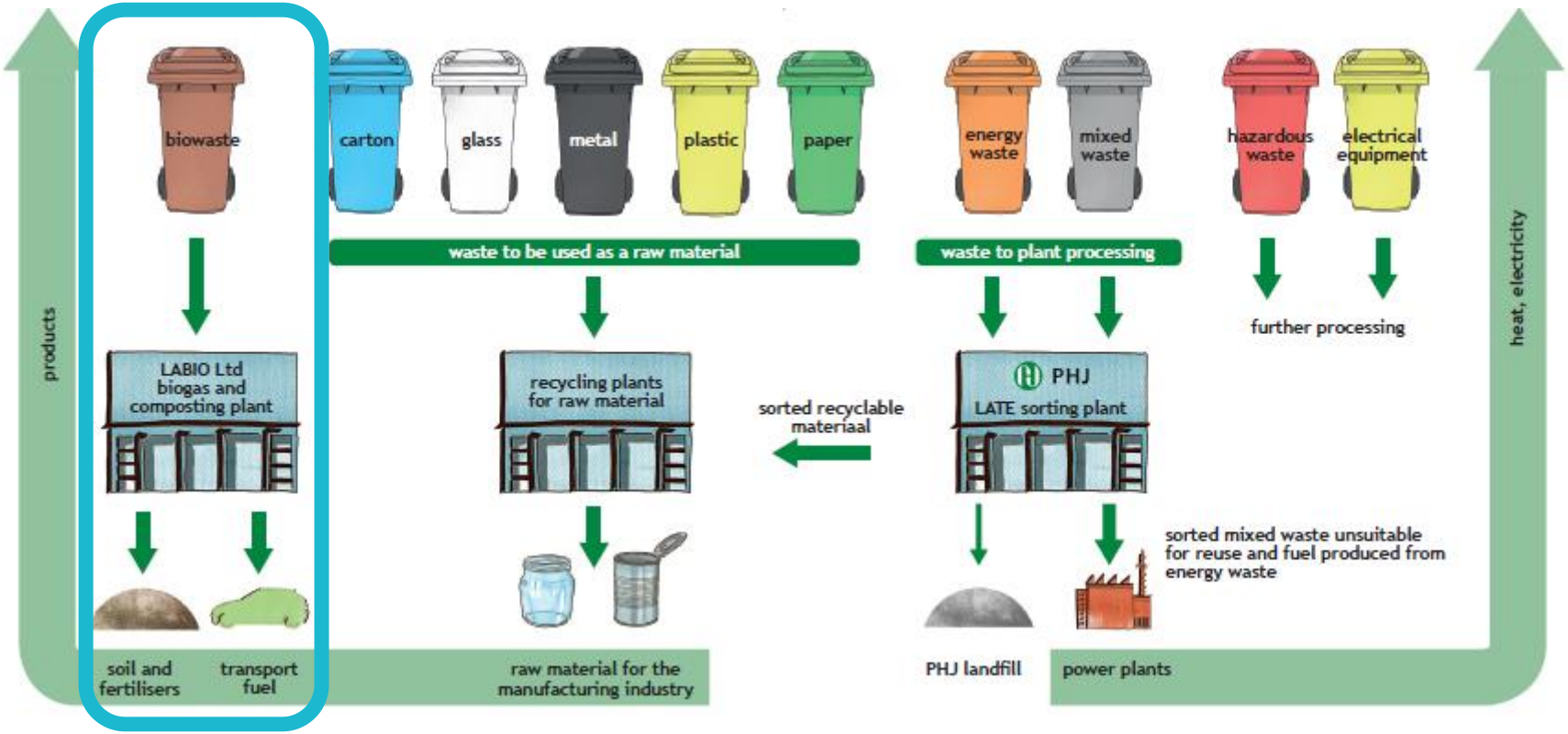


- About 200,000 t of waste is received each year.
- In 2019, 43% of the total amount was municipal waste (87,000 t).
- In 2019, the amount of biowaste and garden waste from Päijät-Häme region was 15,000 t.

Municipal waste recovery in Päijät-Häme region



Waste sorting and management system in Päijät-Häme



- Blocks of flats with at least 10 households > biowaste bin
- One-family-houses, multi-dwelling units with 3–9 flats > composter or biowaste bin when possible

When and why did the region decide to set up a biogas plant for organic waste?

- The investment in the plant was made based on the owners' waste treatment needs and to follow public strategy.
- The investment in a **composting plant** was decided 2003
  - separate collection of biowaste begun in 1994
  - composting outside was causing odor problems

- The investment in a **biogas plant** was decided 2012
  - environmental reasons: regional interest in being a forerunner in environmental terms
  - economical reasons: profits from selling gas

LABIO Ltd - composting and biogas plant

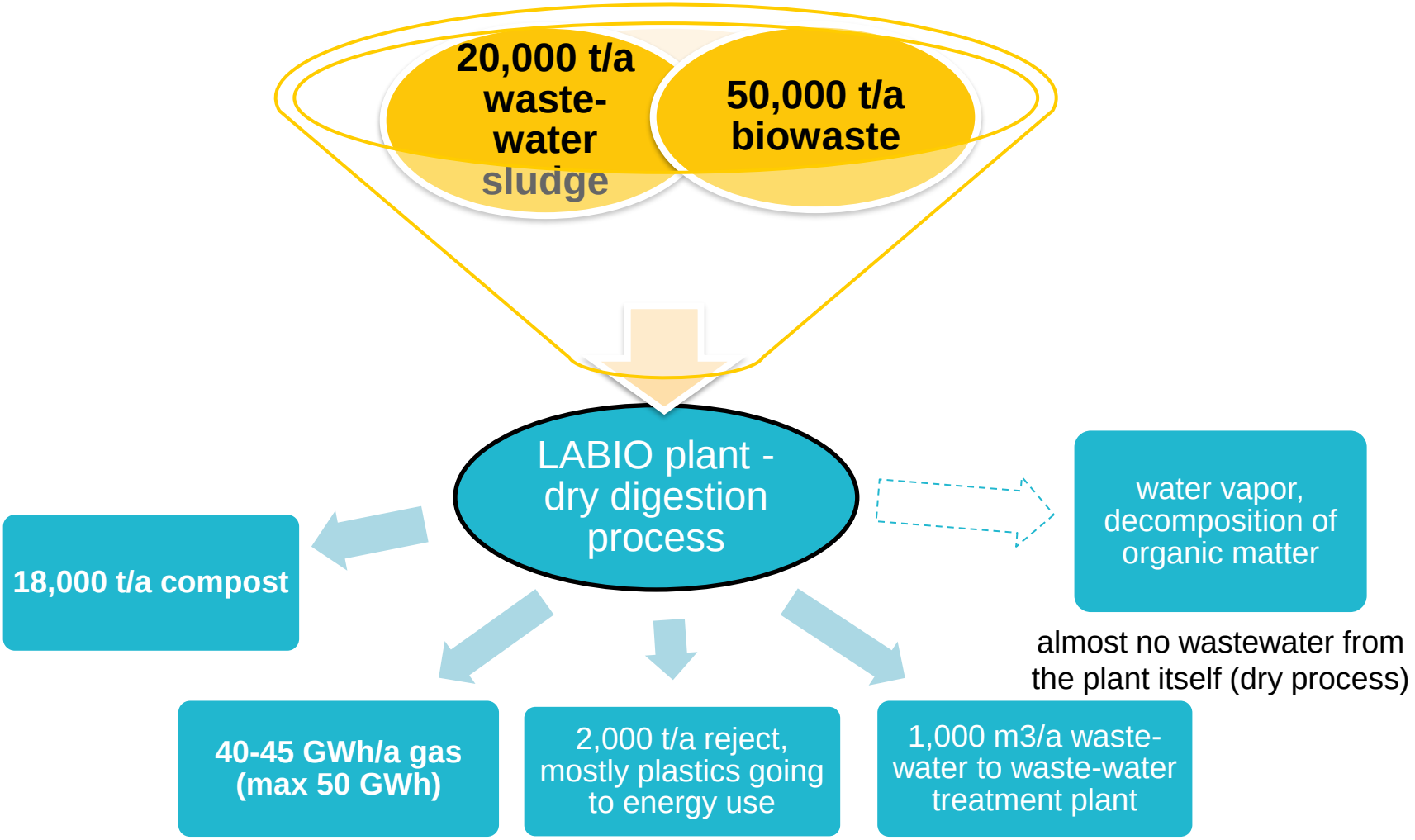
- The composting plant has operated since 2005 and the biogas plant since 2014.
- Recycling of biowaste and wastewater sludge as material and renewable energy.

What biowaste is collected and allowed into the LABIO plant?

- municipal biowaste
- biowaste from shops and food industry (also with packaging)
- sludge from wastewater treatment plants
- biodegradable material from farming, forestry, fisheries

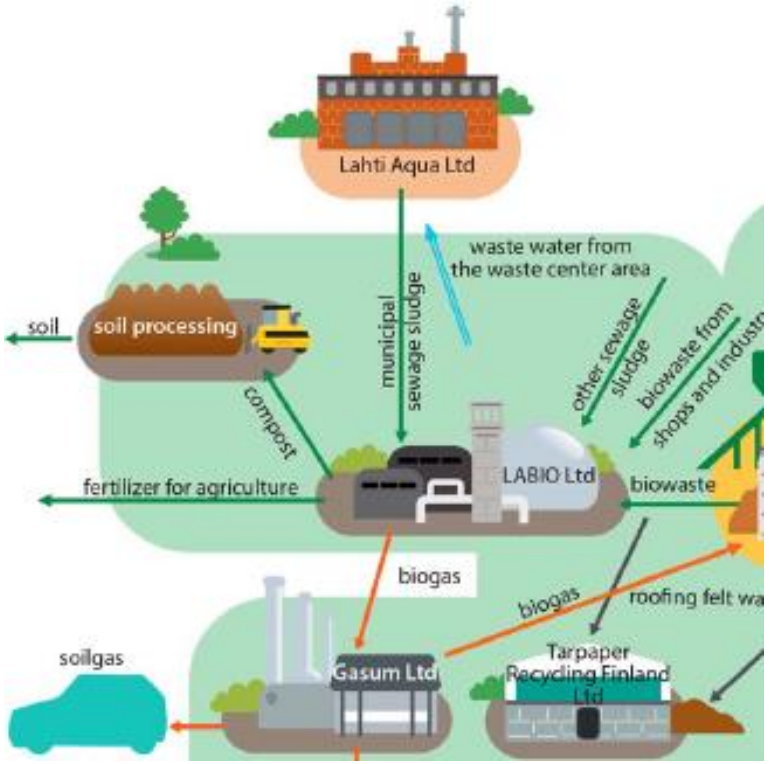
- waste is collected within a radius of 100 km
- household biowaste only from Päijät-Häme region

LABIO - Process flowchart



What happens with the gas and digestate?

- Biogas is transported through the pipes to the nearby operator for upgrading and distribution in the gas network (Gasum Ltd).
- Digestate is processed with other biowaste in the composting facility to produce compost, soil and other growing solutions.
- Compost is further used in agriculture, cultivation and gardening.
- Heat energy from the composting process is used to heat the biogas facility.



Costs and business model

- LABIO Ltd is an independent company financing all costs through selling waste treatment services and biogas.
- LABIO handles the waste of its owners (Päijät-Häme Waste Management Ltd and the public water service provider Lahti Aqua Ltd) and provides services to others as well.
- The biogas plant purchase was made with open tendering method.
- The LABIO biogas plant was financed through public companies Päijät-Häme Waste Management Ltd and Lahti Aqua Ltd with total investments of 15 M€.
- LABIO gets revenues mainly from waste treatment services (gate fees), and also from gas sales.
    - The turnover in 2018 was 5,5 M€ consisting of gate fees 4,6 M€ and biogas income 0,9 M€. The operating profit was 0,1 M€.

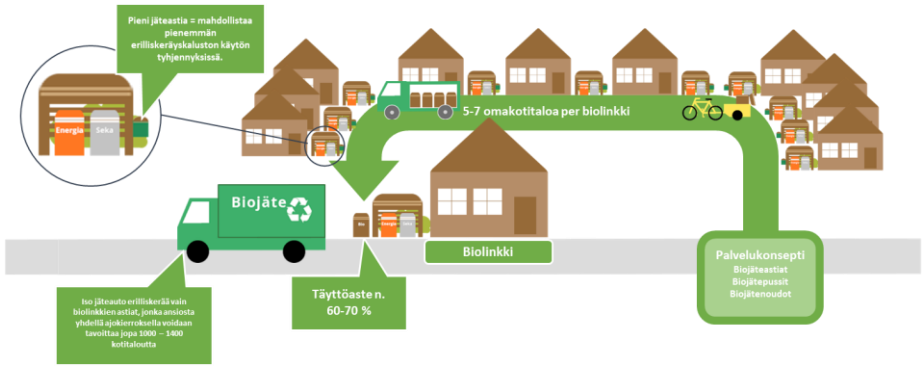
Lessons learnt

- Waste markets are developing quite fast. Long lasting agreements in order to ensure adequate incoming waste streams are needed to pay back big investments.
  - E.g. LABIO has standard gas price agreed with Gasum for 4-5 years

- Possibility of separating processing lines for biowaste and sludge, if financially sustainable in the future.
- Challenges of utilizing sludge-based fertilizers and soil.

Developing separate collection of household biowaste in Päijät-Häme

- One of the actions in the BIOREGIO action plan in Päijät-Häme focuses on developing the biowaste collection from one-family-houses.
- An ERDF funded project ‘BIOSYKLI’ will pilot two methods of separate collection of bio-waste and produce resident-based information to promote separate collection:
  - satellite operations for bio-waste with lighter vehicles than waste trucks
  - composts, which can be emptied in the same way as normal waste bins, e.g. in wintertime



European Union
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Leverage from the EU 2014–2020

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Thank you!

susanna.vanhamaki@lab.fi

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Read more:

Vanhamäki, S., Virtanen, M., Luste, S. & Manskinen,K. **Transition towards a circular economy at a regional level: case study on closing biological loops.** Resources, Conservation and Recycling 156. https://doi.org/10.1016/j.resconrec.2020.104716

Environment & resource efficiency

€ 1.30 M ERDF

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