



PHJ

*Jäte on kaunis*  
WASTE IS BEAUTIFUL

# Waste Management in Lahti Region

## Päijät-Häme Waste Management Ltd (PHJ)

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Sertifioitu toimintajärjestelmä SGS  
ISO 9001, ISO 14001, OHSAS 18001

# Päijät-Häme Waste Management Ltd (PHJ)

- 10 owner municipalities
- founded in 1993
- 203 000 residents + summer residents
- approx. 13 000 businesses
- turnover in 2016: €15,7 million
- personnel: 40 regular employees, as well as contractors' staff
- majority shareholder (58,6 %) City of Lahti



# Operating concept

- Waste management is a basic municipal service that impacts on citizens' health and the environment.
- **The task is to take care of municipal waste management** on behalf of our owner municipalities as comprehensively, efficiently and cost-effectively as possible - with the exception of transport (contract-based).
- Statutory operations are supported by **market-based operations**.

# Certified management system



ISO 14001 - environmental management system



ISO 9001 - quality management system



OHSAS 18001 occupational health and safety management system

Our systems are verified by the SGS Fimko Ltd.



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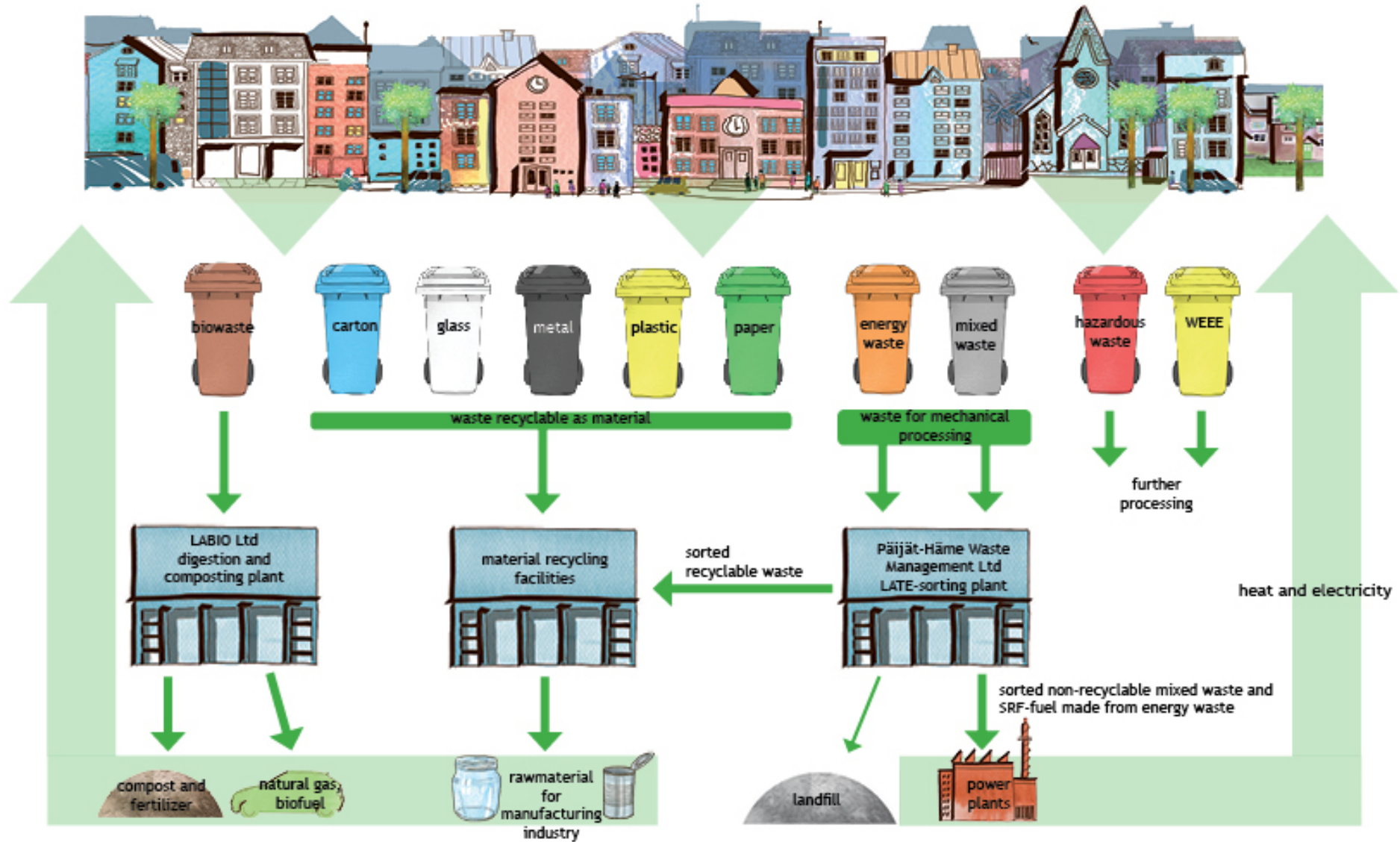
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# Municipal Waste Management System in Päijät-Häme

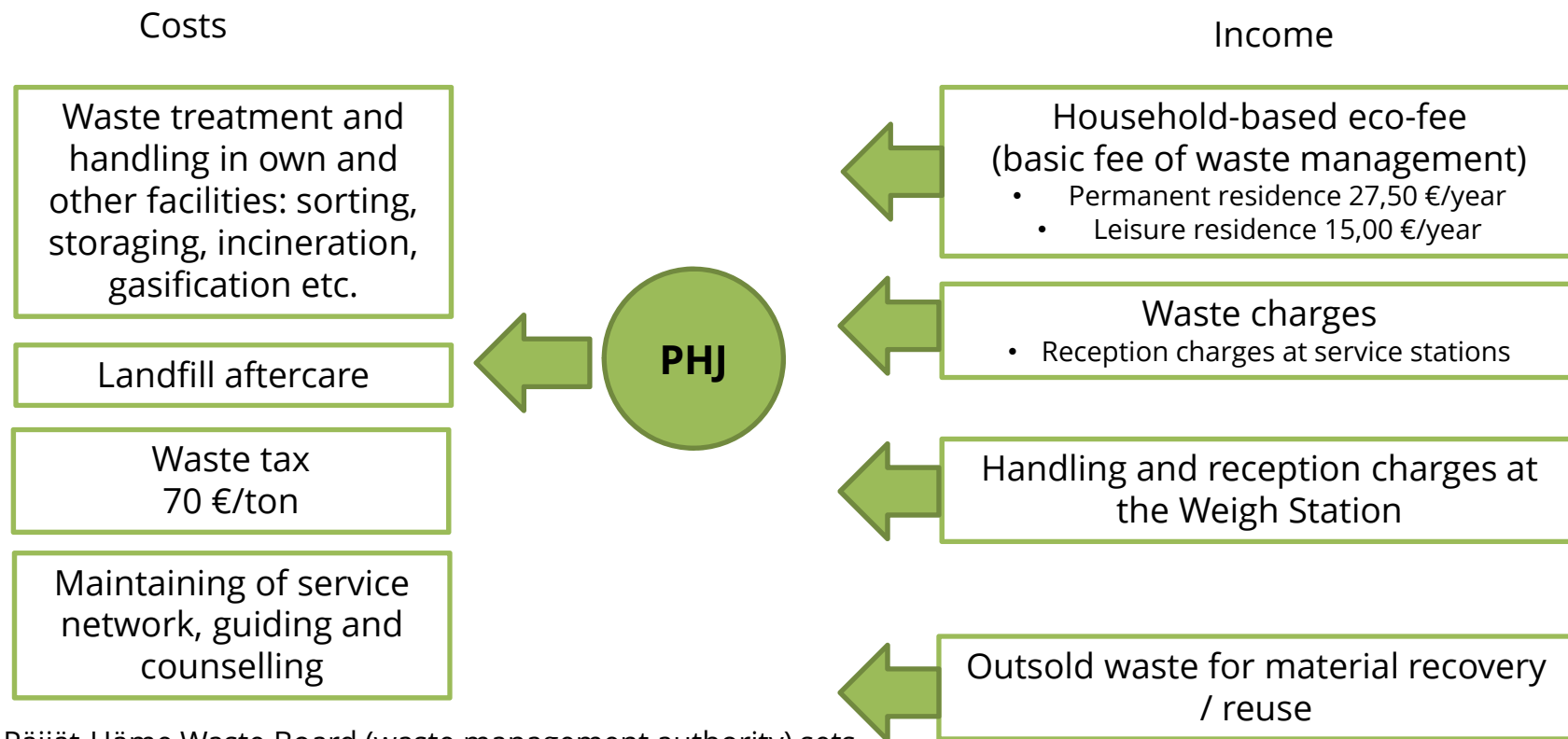
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# Household waste sorting system



# Funding of municipal waste management

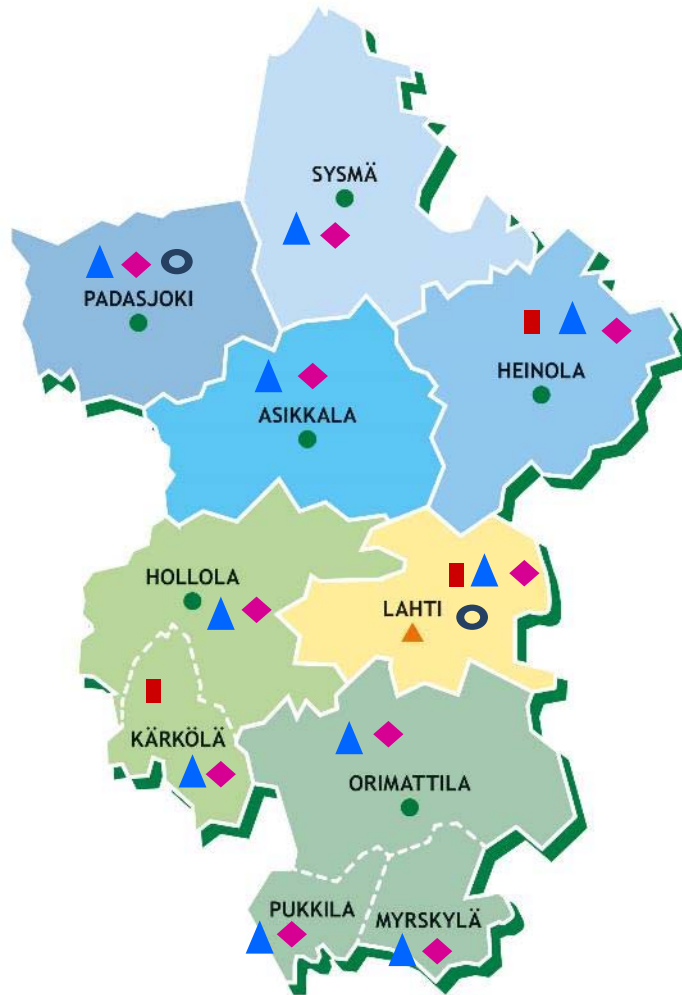


Päijät-Häme Waste Board (waste management authority) sets the fees/charges for waste.

Domestic waste management is not funded with government (taxation) but with waste charges set by communal authorities.

Waste transport companies charge residences when emptying the waste bins.

# Service network



● jäteasema  
▲ Kujalan jätekeskus ja jäteasema Pilleri

- ▲ Kujala Waste Treatment Centre
- 7 big waste reception stations
- 3 receptacles for hazardous wastes at service stations
- ▲ All pharmacies in the area accept waste medicine
- ◆ Collection rounds of hazardous waste, electrical devices and metal (Roinaralli)
- Recycling centre as a partner

Rinki eco take-back points for recycling packagings in every municipality of the area





Receptacle for hazardous waste

2006/08/03

# Waste reception stations serve the residents



Around 140.000 customers  
in 2016

- 7 big collection stations, one in each service area
- staffed reception
- no charge for recyclable wastes
- small amounts from residents, max. 1 m<sup>3</sup>
- wood, metal, rock/gravel, tree stumps
- brushwood and garden waste
- hazardous waste
- gypsum, bitumen roofing felt, bricks
- windows with frames
- large items such as furniture
- WEEE etc.



# PILLERI waste reception station at Kujala waste treatment centre



- open weekdays 7 am – 8 pm
- and Saturdays 10 am – 2 pm
  
- accepts all household waste that cannot be placed in waste containers at home
  
- serves around 80.000 residents yearly

# Rinki eco take-back points for recycling household packaging waste

- The network of Rinki eco take-back points is maintained by Finnish Packaging Recycling RINKI Ltd
- There are all together 60 eco take-back points in the operational area of Päijät-Häme Waste Management Ltd
- Points are meant for recycling household packaging waste: carton, glass, metal and plastic (plastic recycling in some of the points)
- Also paper, clothes and textiles can be recycled in most of the points



Points can be found in [www.rinkiin.fi](http://www.rinkiin.fi) and [kierratys.info](http://kierratys.info)



# Guiding and counselling



Nearly 10.000 residents got advice on waste in 2016.  
Service number was answered 5.700 times in 2016.



# Sorting starts in the kitchen



Energy Waste video:

<http://www.youtube.com/watch?v=fgTy3zKbM74>

# Multi-unit dwellings

Multi-unit dwellings **with at least 10 apartments** are obliged according to municipal waste management regulations to have seven sorting bins

- Biowaste
- Energy waste
- Mixed waste
- Paper
- Carton
- Metal
- Glass

Half of the region's residents live in this group!



# Detached houses, terraced houses, leisure homes

Detached houses and small properties as well as leisure homes **with less than 10 apartments** are obliged according to municipal waste regulations to have two waste sorting bins:

Mixed waste  
Energy waste  
(Paper: apartments with at least three apartments)

Half of the region's residents are in this group!



Composting of bio-waste is recommended!

Glass, metal, carton and plastic packagings to the Rinki eco take-back points!

# Non-residential properties

## Municipal waste management regulations

### **All:**

- mixed waste (residual waste)
- energy waste

### **20 kg/week:**

- cardboard\*
- glass\*
- metal\*

### **50 litres/week:**

- biowaste\*

### **50 kg/week:**

- wood\*

**Paper** according to Finnish Waste Act (49 ja 50 §)

\*Obligation to separate involves areas under city/town plans in Asikkala, Heinola, Hollola, Lahti, Nastola ja Orimattila (not Artjärvi).

# Biowaste

(organic, compostable waste)



=> biogas, fertilizer, soil

- food waste
- paper napkins
- flowers and soil
- coffee grounds with filters
- tea bags
- small bones (not hambones)
- sauna branches
- newspaper used as liners



# Energy Waste (combustible waste)



Plastic and paper-based  
packaging waste

Also clothes and other textiles

NOTE: Not PVC plastic (symbol 03)  
No aluminium!

=> Heat and electricity

# Mixed Waste (residual waste)



Waste that cannot be recovered as material or as energy waste (SRF production)

=> Heat and electricity



# Municipal solid waste recovery in Päijät-Häme region

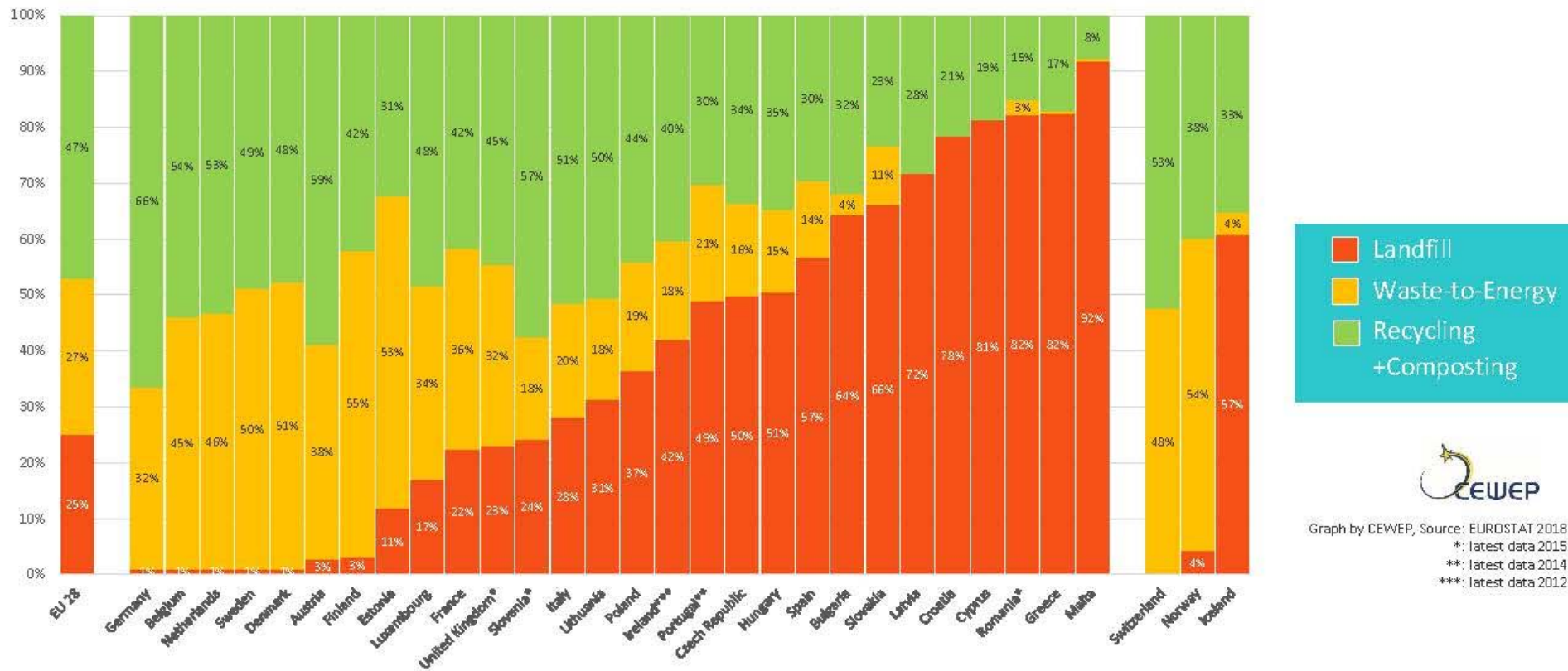
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# Municipal waste treatment in 2016

EU 28 + Switzerland, Norway and Iceland

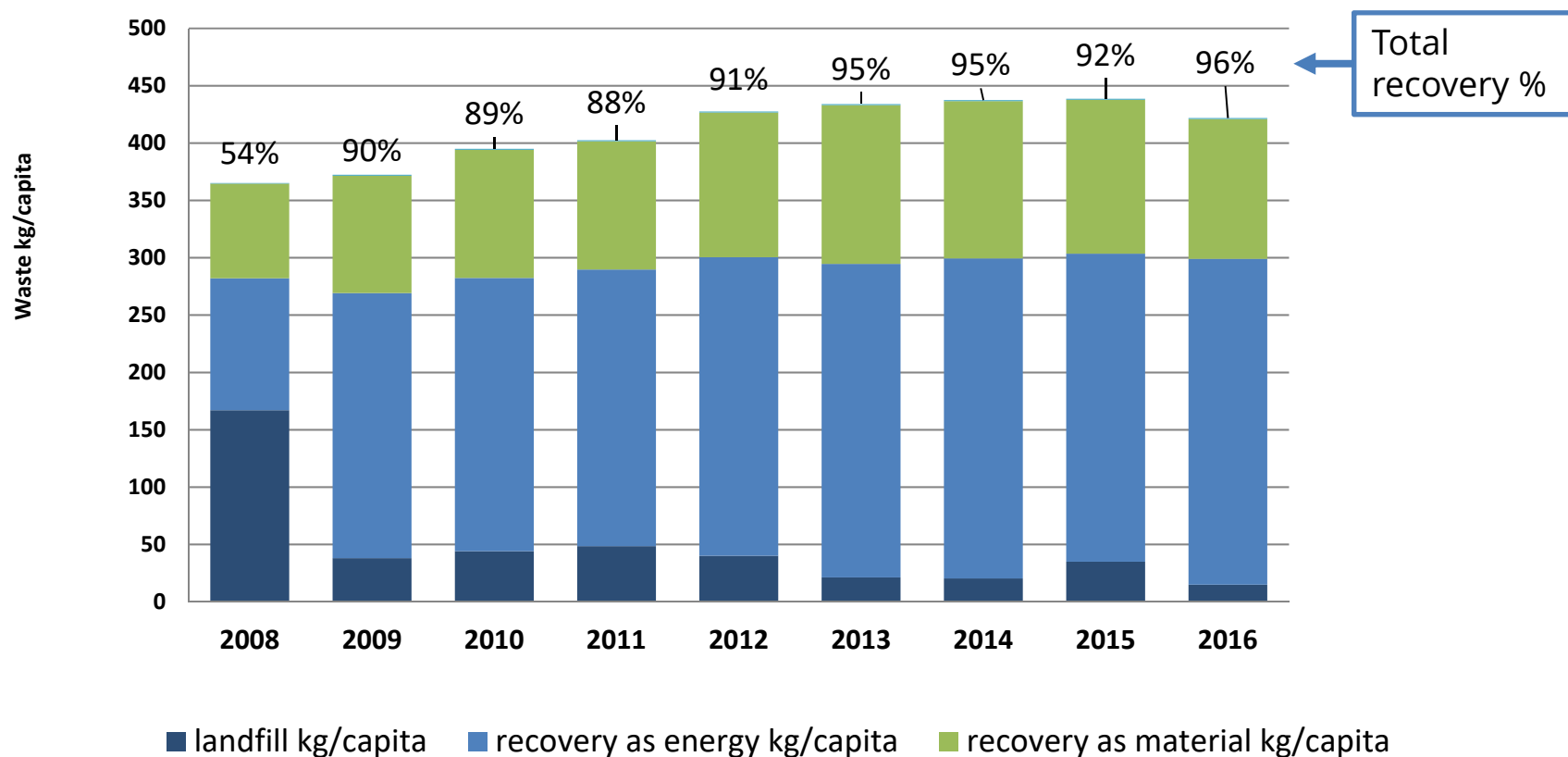


- Landfill
- Waste-to-Energy
- Recycling + Composting



Graph by CEWEP, Source: EUROSTAT 2018  
 \*: latest data 2015  
 \*\*: latest data 2014  
 \*\*\*: latest data 2012

# Municipal solid waste recovery 2008-2016 PHJ







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# Waste treatment in Kujala Waste Centre

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# Kujala Waste Centre

70 hectares, 30-year lease from City of Lahti. In 2016 total 203 825 tons of waste received, of which 92 % recovered







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# Landfill

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In 2016 only 4 % of MSW that came in ended up in the landfill



Kujala's landfill in use which complies with EU regulations, approx. 2 hectares, was opened in 11/2007. Expansion phase II was opened in 2/2010.



# Landfill

- In 2016 only 4 % of received municipal solid waste was placed in the landfill
- The waste in the landfill is not currently recoverable
- Since 2016 it is forbidden to place any organic/ biodegradable waste in the landfill
- According to Environmental permits and Waste Law the decommissioned landfills will continue to be maintained and inspected for at least 30 years



# Biowaste, garden waste and sewage sludge

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# Handling biowaste and garden waste: Digestion and composting plant, LABIO Ltd

- Ownership of LABIO Ltd: Päijät-Häme Waste Management Ltd 40 % / Lahti Aqua Ltd 60 %
- New Biogas facility started autumn 2014
- Investment € 12 million. Turnover approx. € 2.5 million
- Plant treats biowaste, garden waste and sludge by digestion/ decomposting , 70.000 t /y
- During digestion process biogas is being gathered and afterwards stored in the gas-tank, cleaned and refined and fed into gas grid owned by Gasum.
- The facility can produce 50 GWh biogas per year. This amount adds up to fuel for 350 busses or 4500 cars per year.
- The end product of digestion process is decomposted in the composting plant.



# Composting of biowaste and sludge

- Tunnel composting facility finished in summer 2005.
- 60 000 tons biowaste and sludges per year.
- Facility treatment takes about 5 weeks. Post-composting happens outside in piles. End product is hygienic and homogenic and ready for soil improvement agent or breeding ground after converting.
- Composting plant produces 20.000 m<sup>3</sup> compost products annually (fertilizer for agriculture).



Labio



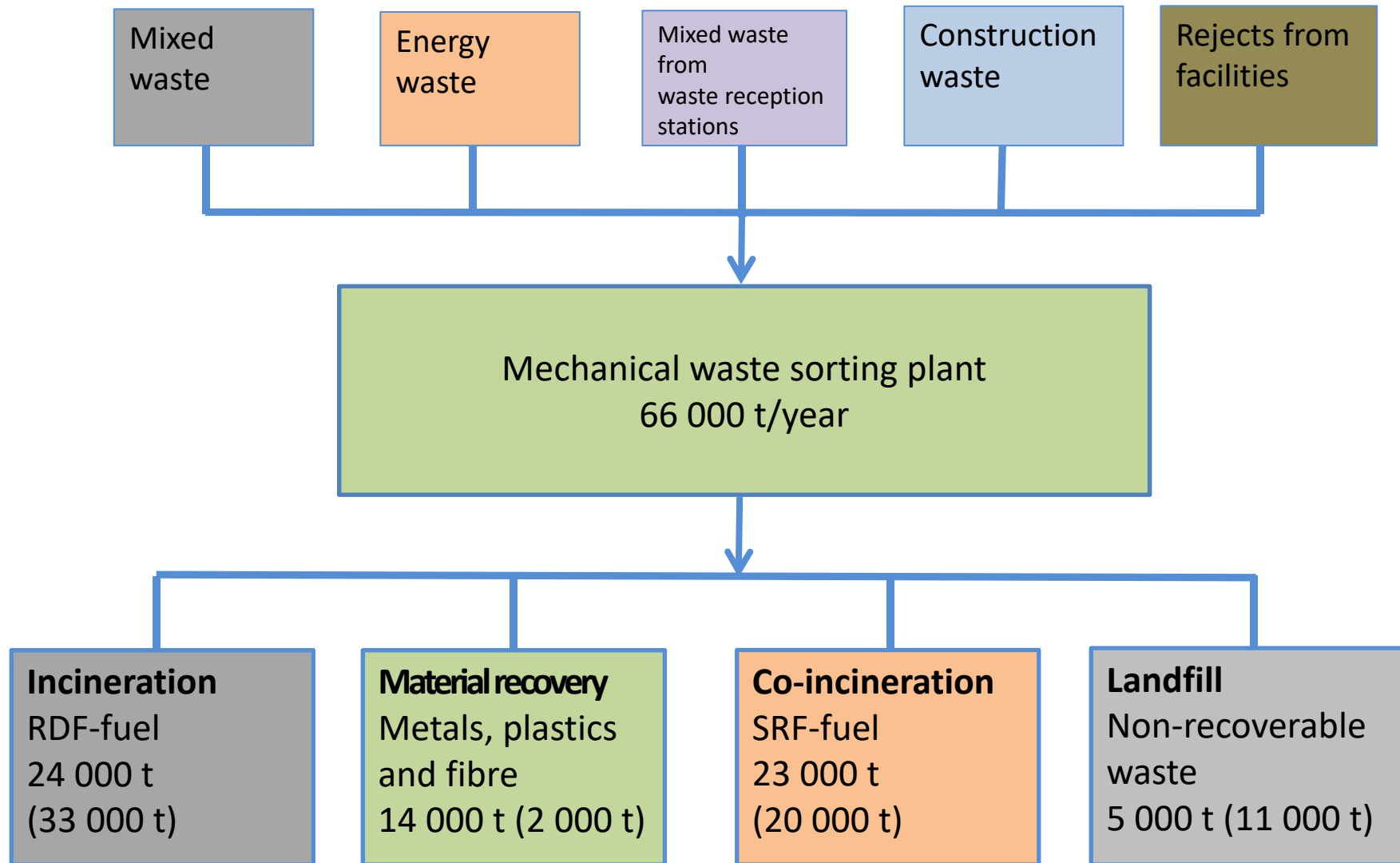


# LATE sorting plant



# LATE sorting plant

- LATE opened in 2016. Total investment 10 M€
- Annual capacity 65,000 tonnes (while operating a two-shift system)
- The aim is to increase material recovery up to 50 %
- The plant processes construction and mixed waste, waste for energy production, and waste generated by industry.
- From these waste types, the plant separates fibres, plastics and various metals that can be recycled or processed further.
- Non-recyclable waste is used in energy production.
- Only small amount of waste such as concrete and bricks are placed in the landfill.
- The innovative and modern sorting plant utilizes the newest mechanical waste-sorting technologies. Waste separation is based on material size, shape, optical and physiological features.
- There are 14 drop-spots for waste separated, total 51 unique equipments.
- Technology from Finland, Germany, Austria and France.



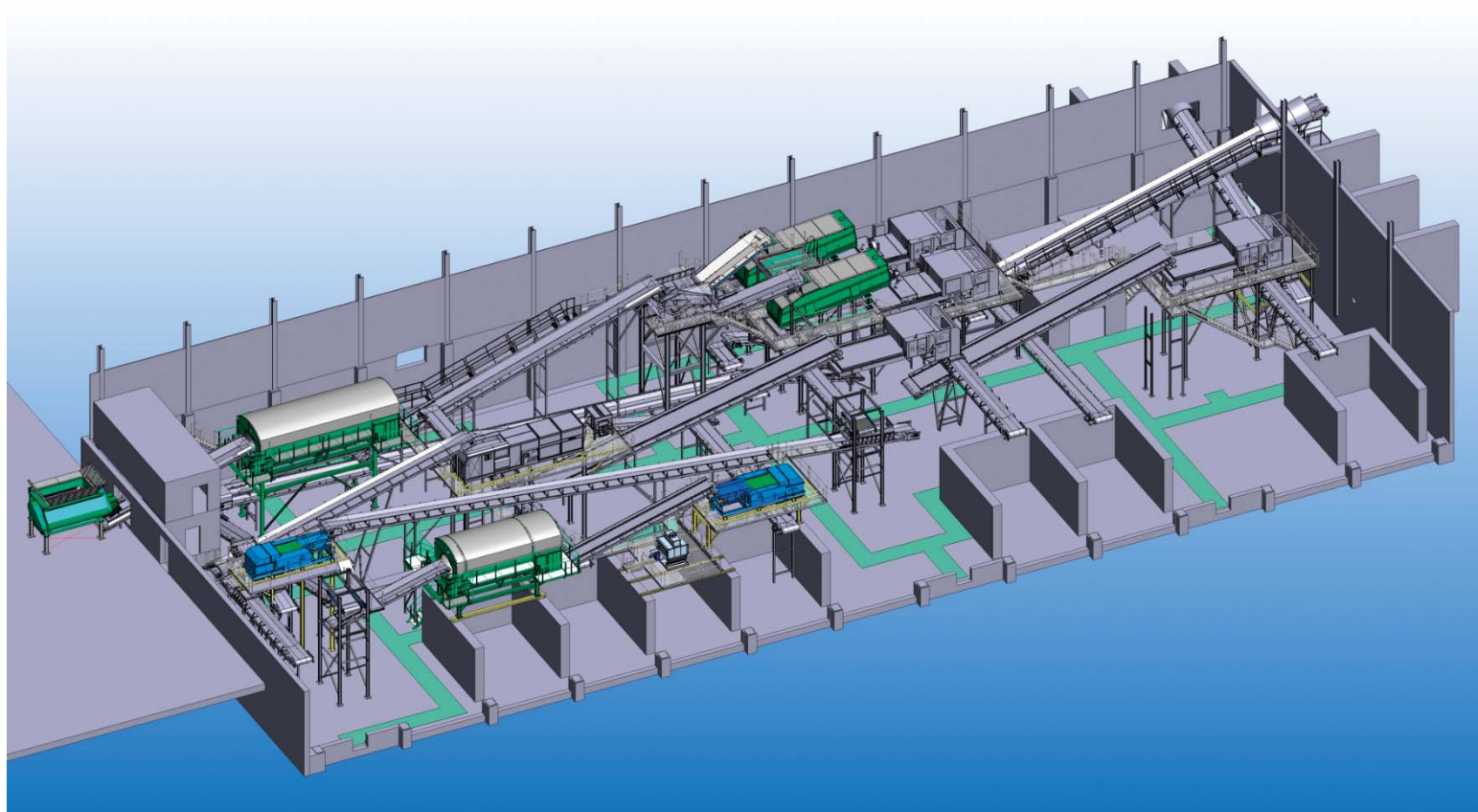


# Technology of LATE plant

Mechanical separation of waste is based on many different screening and sorting techniques. These techniques are widely used in Central Europe. In Finland LATE sorting plant is one of a kind.

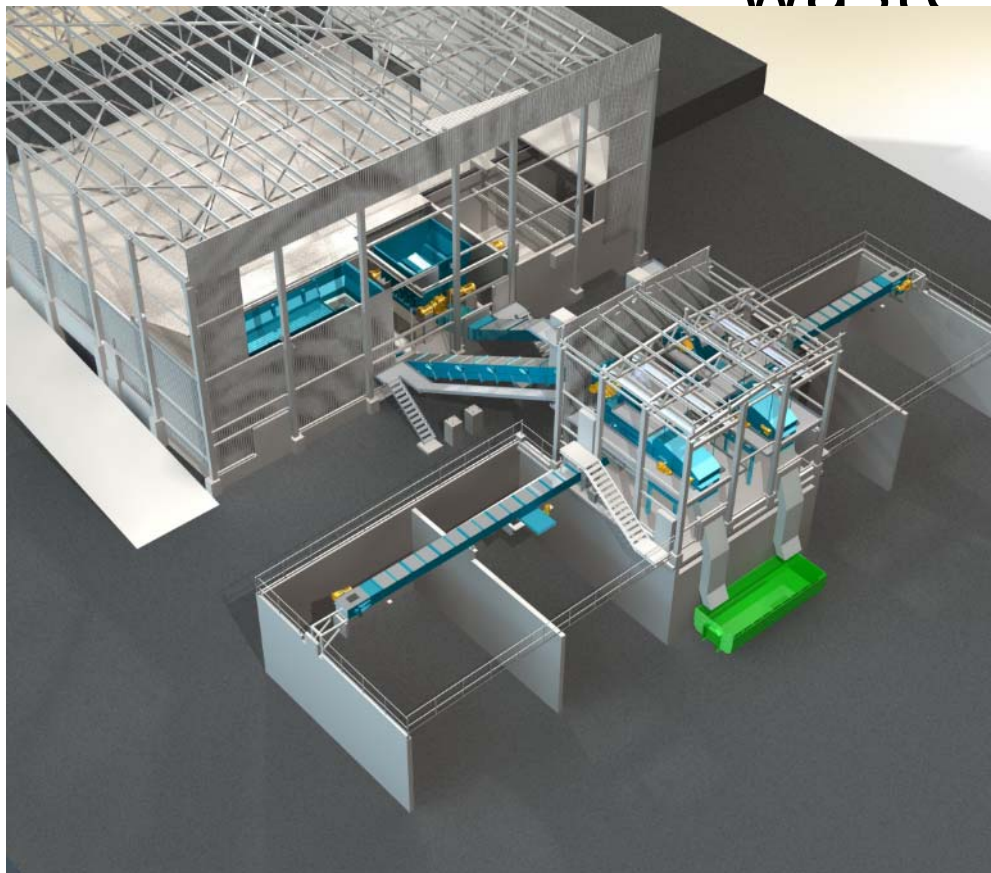
- Drum screen (size)
- Ballistic Separators (shape)
- Optical Sorters (colour, size, shape, consistency)
- Eddy-Current Separator (electric and magnetic fields)
- Overband Magnet (magnetic field)
- Drum-Windsifter (mass)

# LATE Sorting Plant



# MURRE

## Treatment of energy waste and wood waste



TYRANNOSAURUS® SRF processing plant from BMH Technology

- A shredding plant in Kujala Waste Treatment Center, MURRE
- Investment cost 4,4 milj. € in 2011
- Two processing-lines: for energy waste and for wood
- The plant turns sorted energy waste into high quality Solid Recovered Fuel (SRF) by shredding, screening and separating (metals).



Source separated  
energy waste is  
turned into fuel  
(SRF)



The fuel is **sold** to Lahti  
Energy Ltd (Gasification  
plant)

MURRE-video:

<http://youtu.be/CSUI4uQvGB0>

# Energy from Mixed/Residual waste

- Since 2009 about 33 000 tonnes of mixed/residual waste has been incinerated in Kotka Energy´s recovery plant and Ekokem´s plant in Riihimäki.
- Before that it was placed in the landfill.
- Since the opening of LATE Sorting Plant in 2016 only 24 000 tonnes of waste is being incinerated annually.

# OILI - Sludges solidified using the Geotube process



All sludge batches are tested

1. Sand-separating wells and rainwater sands
2. Grease-separating basin sludges
3. Industrial and purification sludges
4. Oil extraction sludges



# Interim storage and recovery of recyclable wastes

The majority of recyclable waste is transferred to material recycling facilities that refine and utilise it in the production of new material.

- Twigs and brushwood (energy generation)
- Garden waste (biogas generation)
- Tree stumps (support material in the composting plant)
- Metal (raw material by the steel and foundry industry )
- Concrete and bricks (utilized in landscaping and road construction)
- Asphalt and bitumen roofing felt (manufacturing of asphalt)
- Gypsum(raw material in the production of new gypsum )
- Windows with their frames (production of glass packaging, glass wool and foam glass)
- Companies' plastic packaging (manufacturing of plastic products)



Approximately 5.3 hectares is used for the reception and storage of recyclable waste.

# Contaminated Soil Storage Areas

- Severely contaminated soil and soil containing wastes are pre-treated by sifting after which the soil is stabilised and compacted into a non-toxic form.
- The compacted soil is utilised in embankments at the waste site or as preliminary cover for the landfill accordance with its environmental permits.
- Sites cover 2.5 hectares.



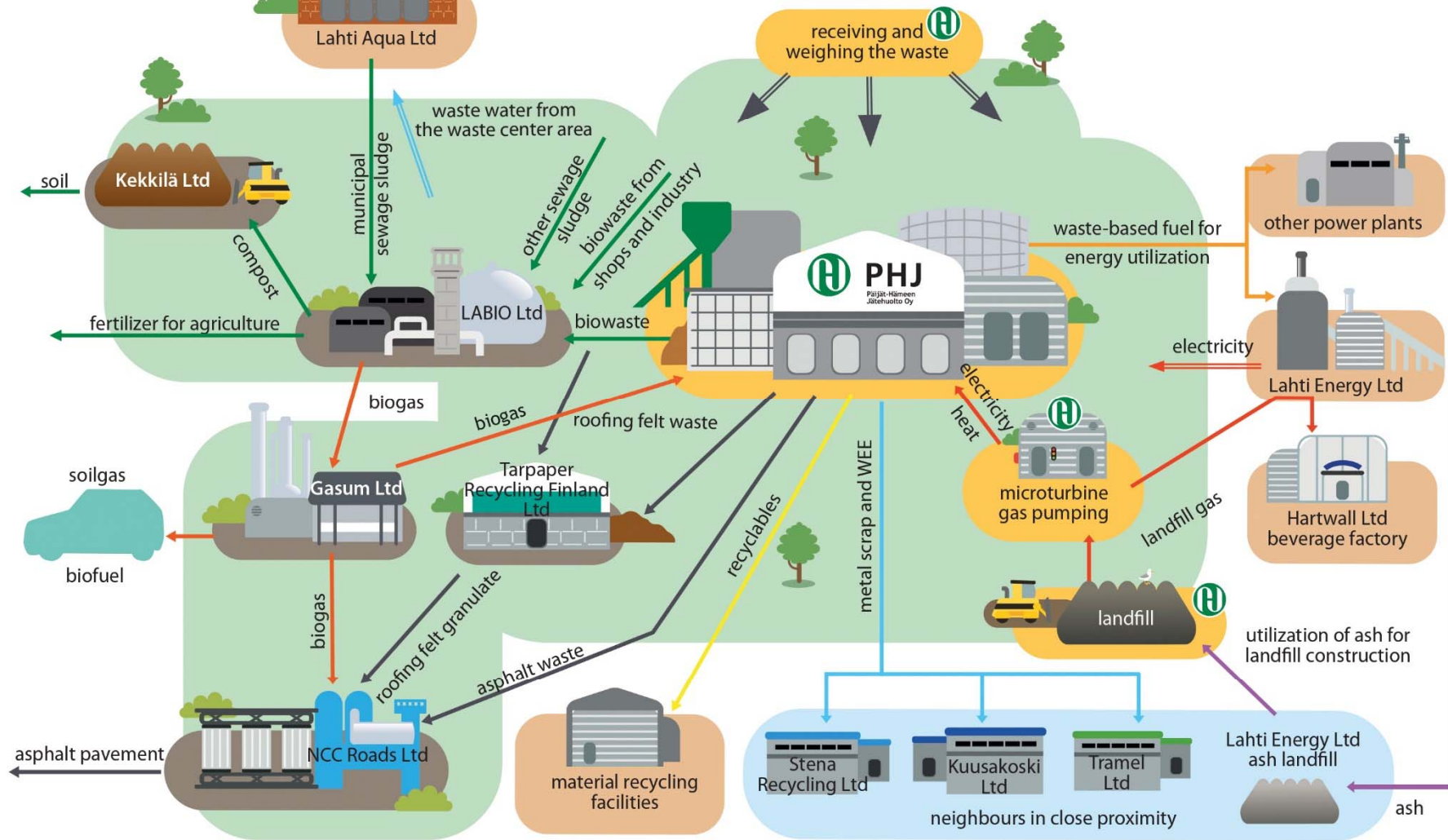
# Roofing felt processing facility



- Tarpaper Recycling Finland Ltd receives, stores and processes bitumen roofing material at Kujala Waste Centre.
- Roofing felt is crushed and used in asphalt production to replace bitumen as raw material.
- Roofing felt crush has EOW-status (2016)



# Kujala Waste Centre- Industrial Symbiosis Lahti, Finland



# Landfillgas since 2002



24 gas wells at the old filling area  
160 mm diam. PET plastic perforated  
pipe, from which is it sucked up into the  
gas pumping station via horizontal  
collection pipes

Length of vertical wells  
approx. 2/3 of waste  
depth, or approx. 8 to 13 m

Biogas pumping station  
capacity: 800 m<sup>3</sup>/hr  
= 4 MW fuel power  
represents 1,000  
single-family homes  
heated with oil  
currently approx.  
2 MW power

# Future challenges

## **More material to recycling -> 50 % (now about 35%)**

- Source separated Biowaste from one family houses?
- Mechanical separation of mixed waste, construction waste, energy waste -> plastic, cardboard, metal

**=> Less incineration**

## **Kujala Waste Centre**

- Place for Industrial Symbiosis
- Energy efficiency



Thank you for visiting us  
and for your interest!

