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CIRCULAR ECONOMY IN CENTRAL FINLAND

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FEDARENE Webinar: The Energy Dimension of Circular Economy, 10.12.2020

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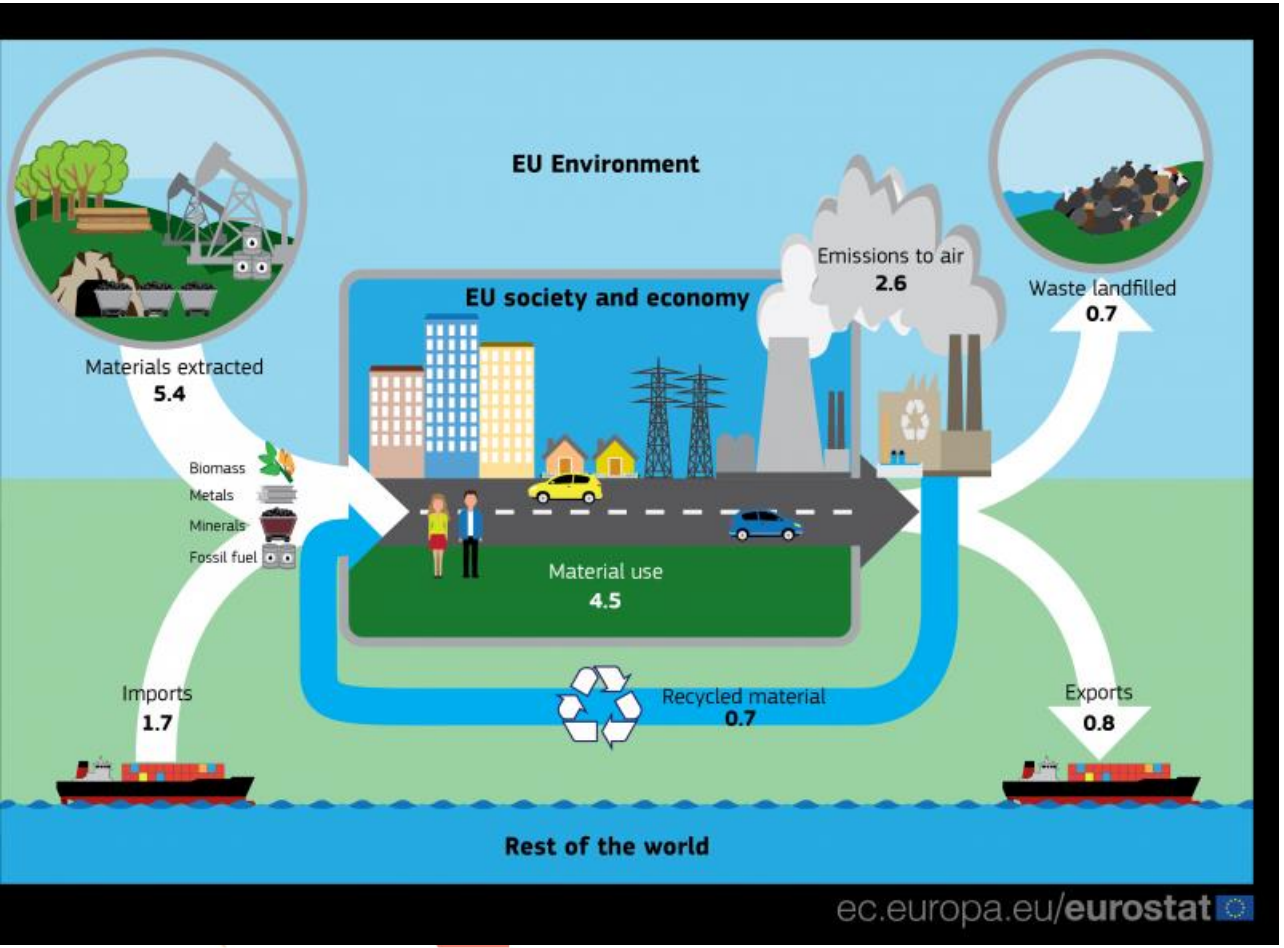
Circular economy



- The purpose of a circular economy is to maintain the value of products, materials and resources for as long as possible by returning them into the product cycle after they have reached the end of their lifecycle, while minimising the generation of waste. Materials such as biomass, metals, minerals and fossil fuels are extracted from the environment **to make products or to produce energy**. When their life cycle ends, products may be recycled, incinerated, or discarded as residual waste. Those material flows are an essential part, albeit not the only one, of the circular economy. The fewer products we discard and the more we recycle, the fewer materials we extract thus benefiting our environment. (Eurostat)
- Global economy uses almost 93 billion tons of minerals, fossil fuels, metals and biomass, and the global economy is only 9 % circular (The circularity gap report 2019)

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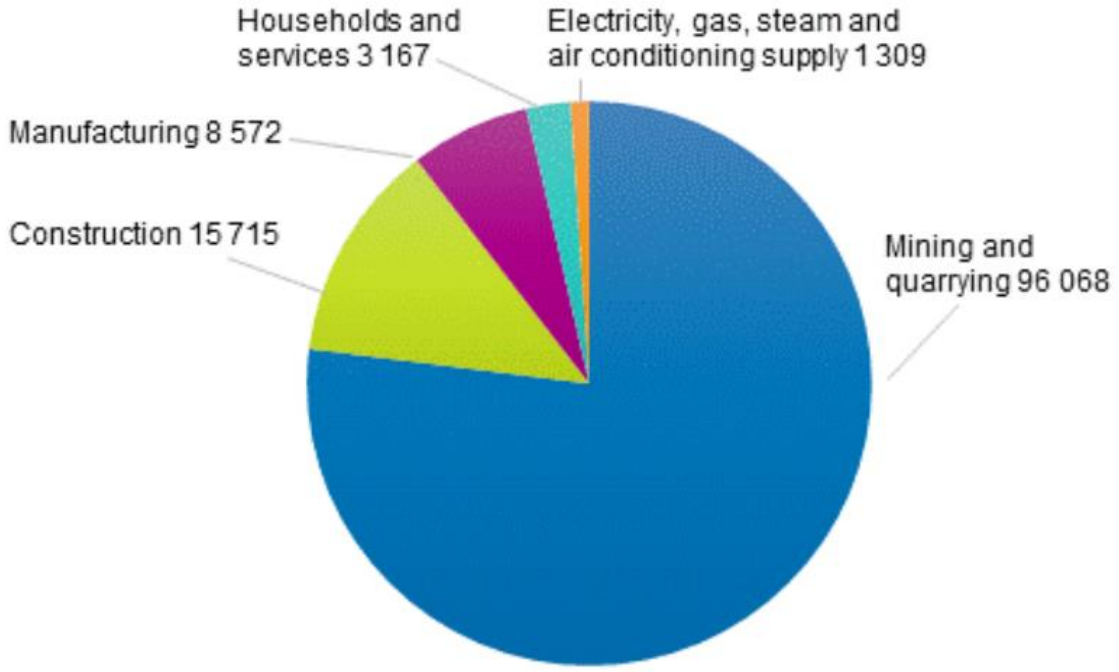
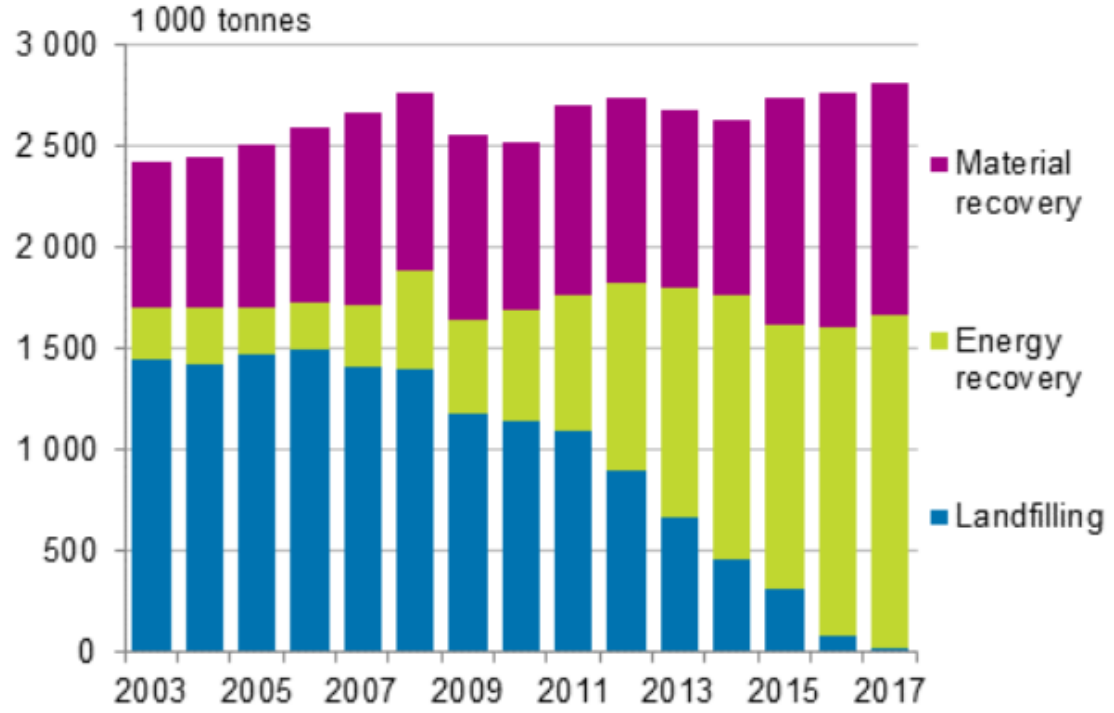
Waste amounts and municipal solid waste treatment methods in Finland

Waste generated by sector and type in 2018, 1,000 tonnes per year



Official Statistics of Finland (OSF): Waste statistics [e-publication].
ISSN=2323-5314. 2018. Helsinki: Statistics Finland [referred: 7.12.2020].
Access method: http://www.stat.fi/til/jate/2018/jate_2018_2020-06-17_tie_001_en.html

Amount of municipal waste by treatment method in 2003 to 2017 (Corrected on 11. January 2019)



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Circwaste roadmap of Central Finland

- Almost 2 million tons of waste is produced annually, biggest proportion is construction and demolition waste

→ roadmap for the region, four main themes:

1) construction and demolition waste: material recovery should (and is) be promoted instead of energy recovery
2) biowaste, biogas and nutrient circulation
3) waste electrical and electronic equipment (WEEE)
4) Plastics: material recovery should (and is) be promoted instead of energy recovery

Circwaste LIFE15 IPE FI 004

Circwaste-project receives financial support from EU for the production of its materials. The views reflected within the contents are entirely the project's own and the EU commission is not responsible for any use of them.

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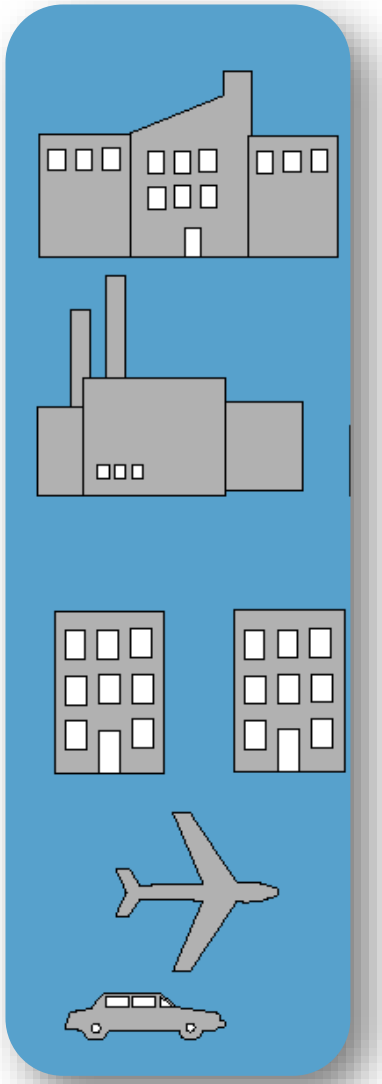
Energy balance of Central Finland 2019

Note: Preliminary results, final results will be ready by the end of 2020.

- Oil 17 %
- Coal 0,1 %
- Peat 8 %
- Wood energy 21 %
- Black liquor 32 %
- Others 5 %
- Water 1 %
- Imported electricity 17 %



Industry **59 %**
- Electricity 34 %
- Process heat 66 %

Heating of the buildings 21 %
- District heat 49 %
- Wood 14 %
- Oil 17 %
- Electricity 17 %
- Lheat pumps 3 %

Other electricity consumption 6 %
- Living and agriculture 59 %
- Service and construction sectors 41 %

Road transport **14 %**
- Gasoline 29 %
- Diesel 57 %
- Biofuels 13 %

Total 22,3 TWh

* Energy losses 1,8 TWh

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Energy, regional economy and JTP

- **Peat 8 %**
- Just transition plan
  - Peat production (and energy use) has an effect on regional economy
  - How to find new jobs for the people that work in peat production and value chain?
  - How to replace peat in energy production?

  - Could biogas production be a solution?

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Promotion of biogas production and consumption

- Biogas potential in Central Finland is approximately 0.5 TWh annually, currently less than 10 % is in use
- New biogas plants and fuelling stations in recent years
- Rapid increase in the amount of gas fuelled cars, less than 100 in 2017, now more than 700
- Public procurements has been used to promote biogas consumption, e.g. waste trucks and city buses

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Circular economy strategy in Finland

- The world´s first national roadmap to circular economy was published in 2016 by the Finnish Innovation Fund Sitra
  - "Make Central Finland a model province for transport biogas" was one of the pilots in "Transport and logistics" theme

- Right now the strategic programme to promote a circular economy in Finland is under preparation.
  - The aim of the programme is to transform the economy into one that is based on the principles of circular economy by 2035.
  - With this programme, the Finnish Government wants to strengthen Finland's role as a leader in the circular economy.
  - The transition into a circular economy is also a step towards achieving the Government's carbon neutrality target by 2035.

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Energy and material flows

- Carbon dioxide as a raw material for fuel and chemical industry, knowhow in VTT and University of Jyväskylä. **Metener** doing the pilot.
- By burning biomass, coal and peat, the Finnish energy industry produces approximately 1.5 million tonnes of ash. **Ecolan** uses this ash to process tree fertilisers of consistent quality or earthwork materials.
- **WEEEFiner** develop 3D printed scavengers to recover precious metals from various waste fractions, e.g. from WEEE

Total solution for nutrient and energy self-sufficiency in rural areas

Fertilisers for tree farming and earthwork products from power plant ash

https://www.sitra.fi/en/projects/interesting-companies-circular-economy-finland/

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When promoting circular economy..

- Regional data is needed (e.g. **energy, material and waste flows**)
- Involve all the stakeholders, politicians, r&d&i organisations, public sector, **companies** etc.
- Work both, on strategic and on practical level
- Communicate
- Cooperate

- Circular economy: less material consumption, less waste, less emissions, improved regional economy

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Further reading

- https://www.syke.fi/en-US/Current/Carbon_footprint_of_Finnish_household_co(55211)
- https://www.vttresearch.com/en/news-and-ideas/circular-economy-future-requires-lot-clean-energy
- https://www.vttresearch.com/en/news-and-ideas/carbon-dioxide-raw-material-chemical-industry-seeking-climate-friendly-and
- https://www.eea.europa.eu/themes/climate/cutting-greenhouse-gas-emissions-through/cutting-greenhouse-gas-emissions-through
- https://www.nature.com/articles/s41467-020-17928-5

- https://materiaalitkiertoon.fi/en-US