

# History of sustainability in Urban Planning

17.11.2020

AALTO

Systems Thinking in Sustainable Living Environment

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Helsinki



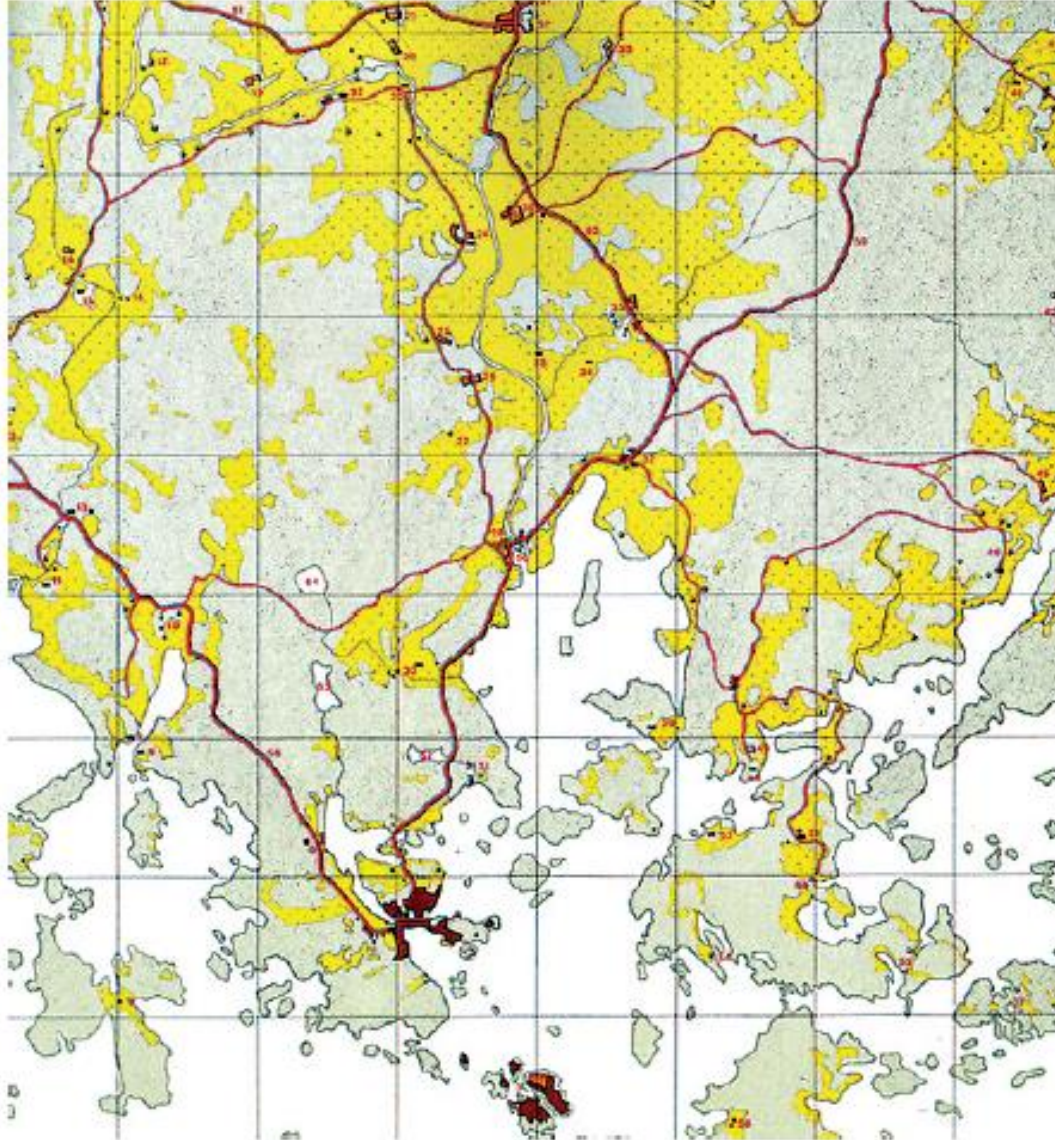
# **(Brief) history of sustainable city planning in Helsinki**

**How city has evolved as a system?**

**Claim:**

**Sustainability is nothing new, only the core values and aspirations behind sustainability have changed over time**

# Early days of Helsinki



1800

Helsinki

# Early days of Helsinki

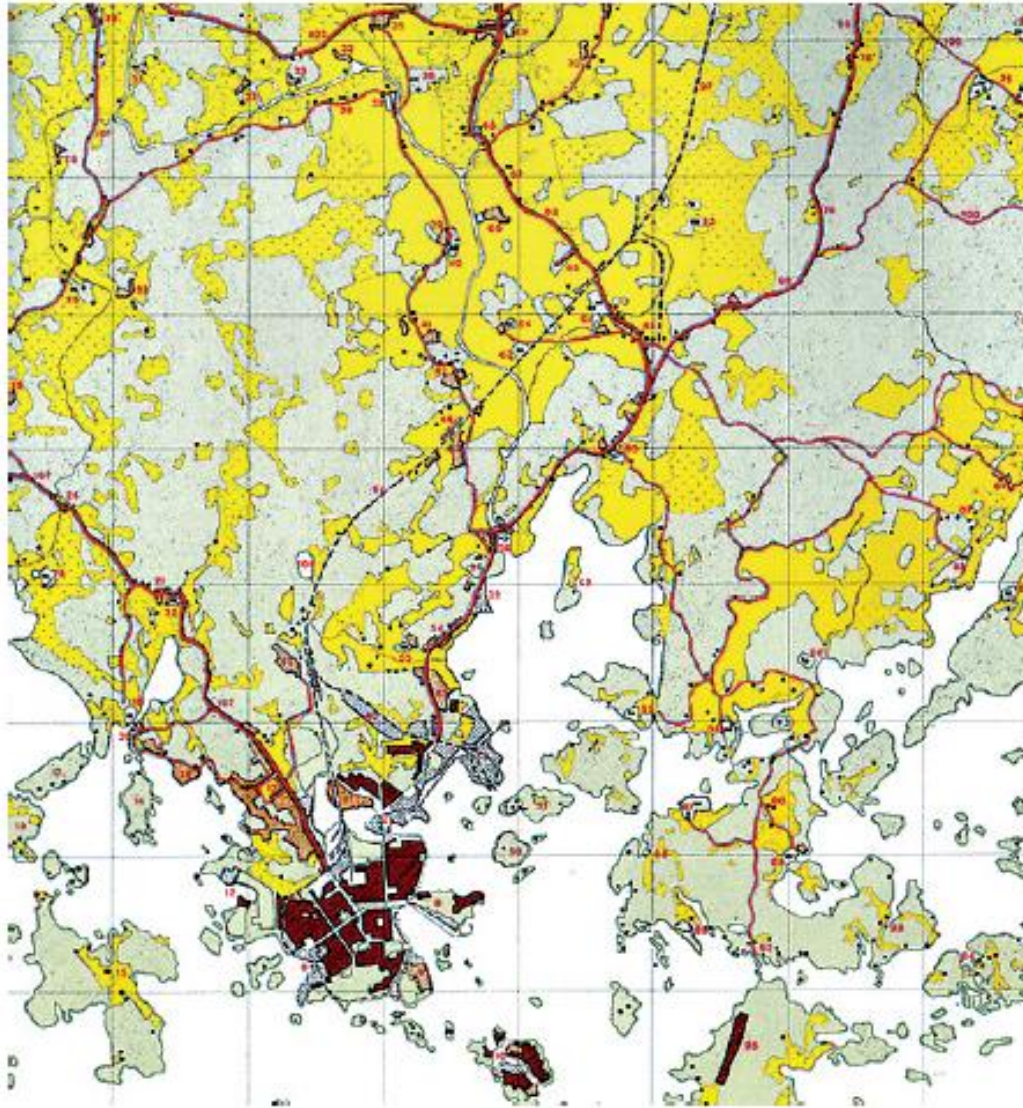


Helsinki

Oilpainting: Oscar Kleinéh, 1877



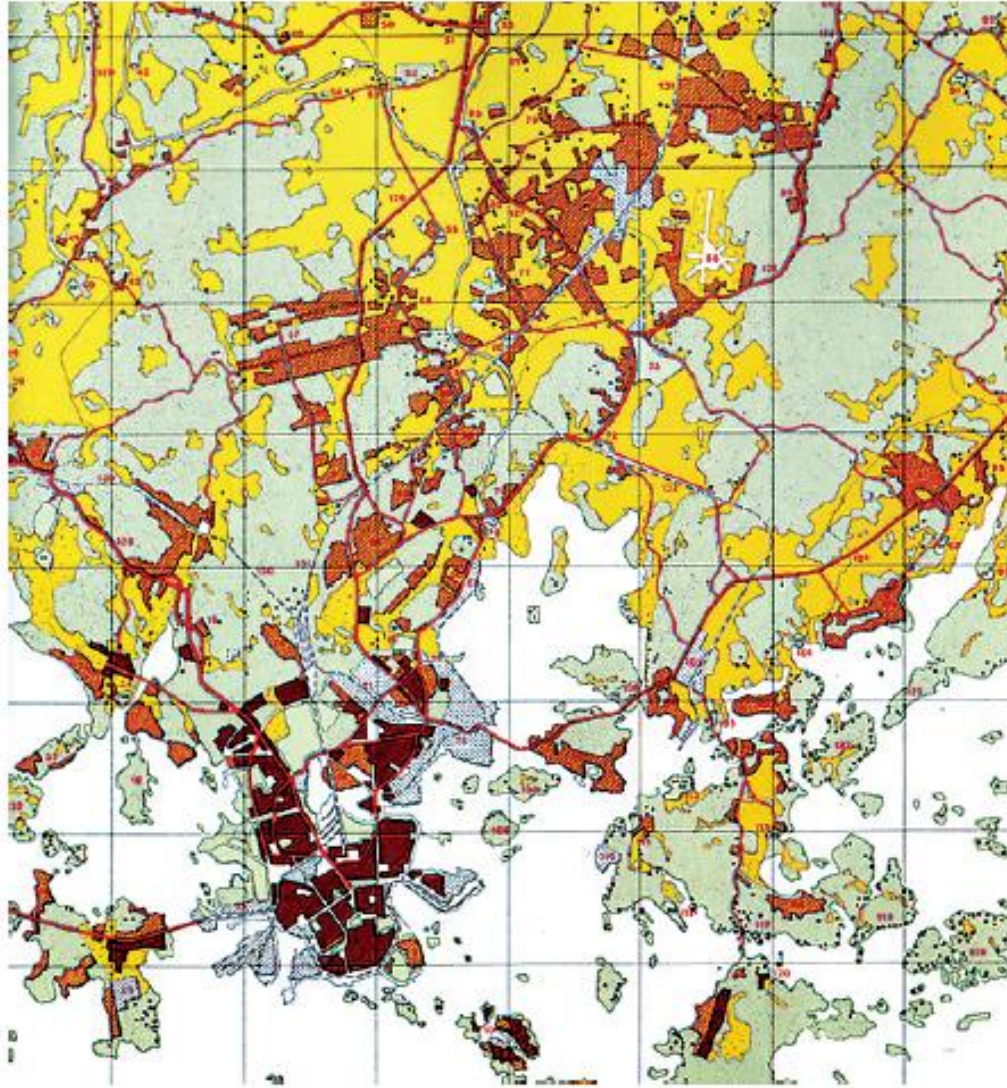
# Monosentric capital



1900

Helsinki

# Expanding urban areas



1940

Helsinki



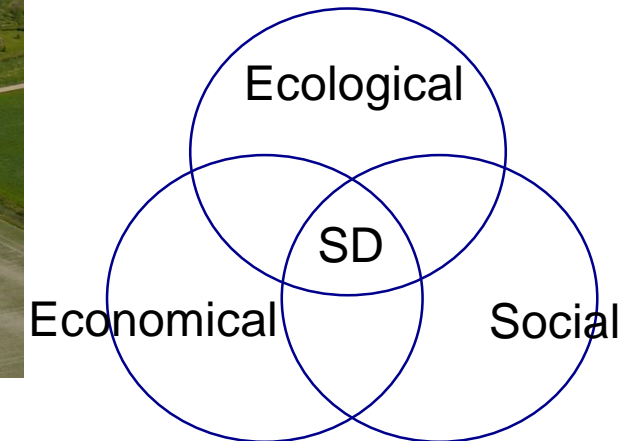
# Expanding urban areas – modernism era



Helsinki



# Eco-Viikki – Ecological City District 1990 ->



- Helsinki's answer to sustainable development as defined by Brundtland Commission
- a finger shaped pattern, "Green fingers" with farming plots between the housing quarters
- almost all the houses directed to south to exploit solar energy
- a wind shelter zone, formed by vegetation between the open field and the built up area
- > completed 2003 - 1 800 inhabitants





# Ecological Building Design Themes in Eco-Viikki Housing



saving energy and water

utilization of solar energy  
passively and actively

healthy indoor climate

building flexibility

healthy materials + timber building

surface water management

quality of the public streets and parks





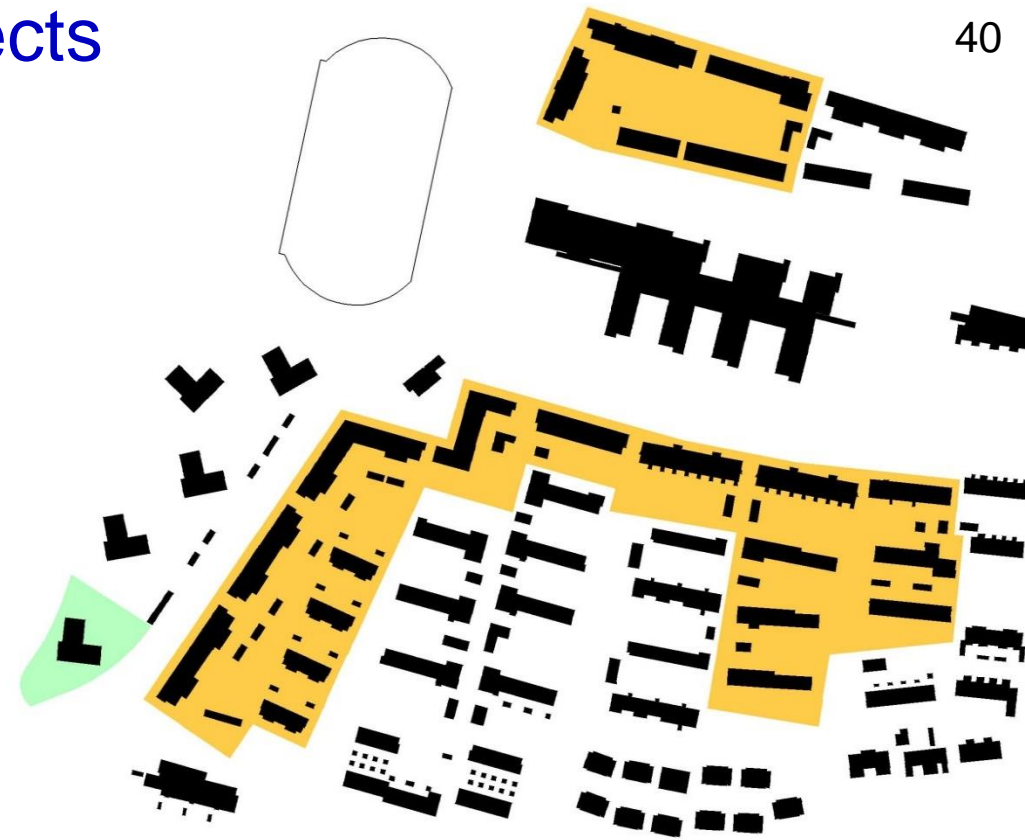
# Viikki - Solar Energy Projects



- Finland's largest solar heating experiment
- supported by EU (THERMIE-programme)
- 9 separate solar heating systems
- About 400 dwellings within the sphere
- Total area of the collectors is 1246 m<sup>2</sup>
- Almost one-third of the energy requirements for heating the domestic hot water
- About 10 % of the annual heating requirements
- Different technical solutions
- The sun collectors are integrated within the roof structure
- The size of one collector is 10 m<sup>2</sup>



SOLAR ELECTRICITY PROJECT





# Timber Building Examples







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# Surface Water Management



-  rainwaters are collected in rainwater sewers
-  rainwater is infiltrated and/or conducted through piping, ditching to the green fingers and park
-  green finger, infiltration and channeling of the rainwater
-  rainwater ditch or pipe





# "Green Fingers"







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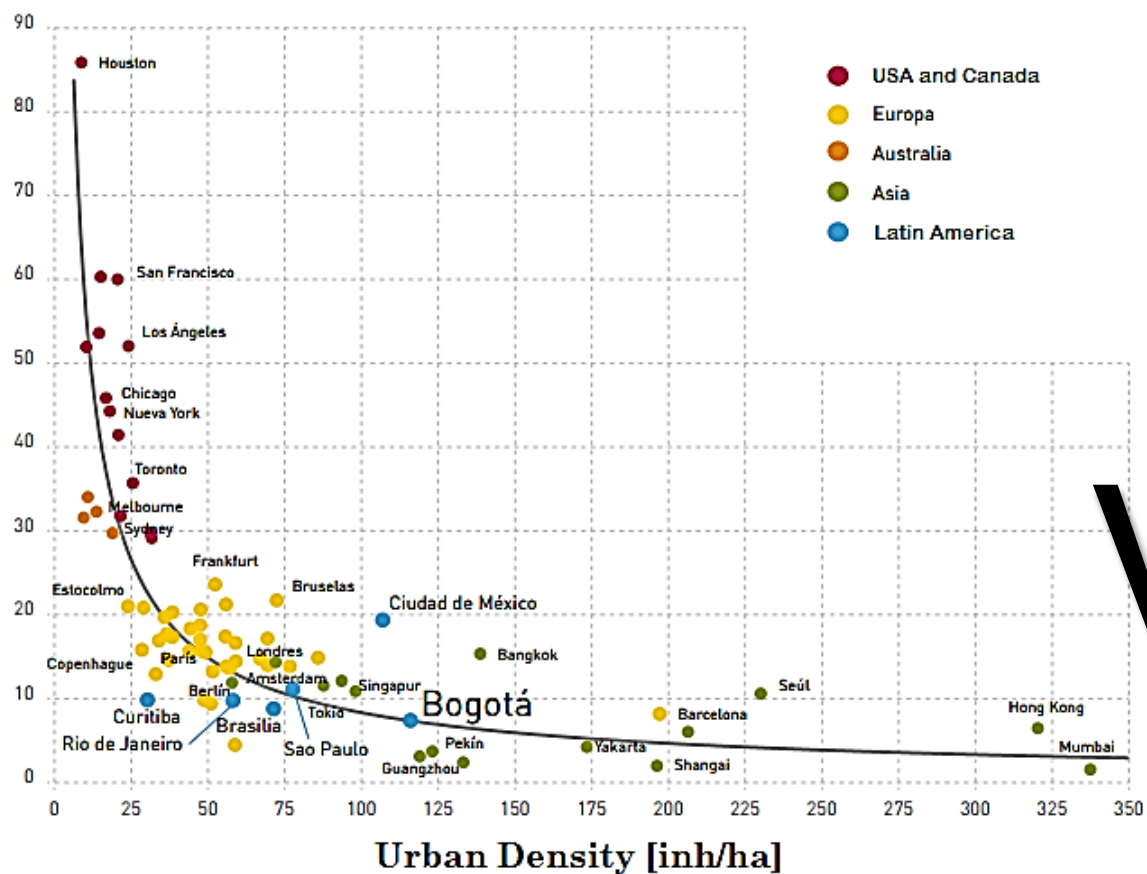


# DENSITY



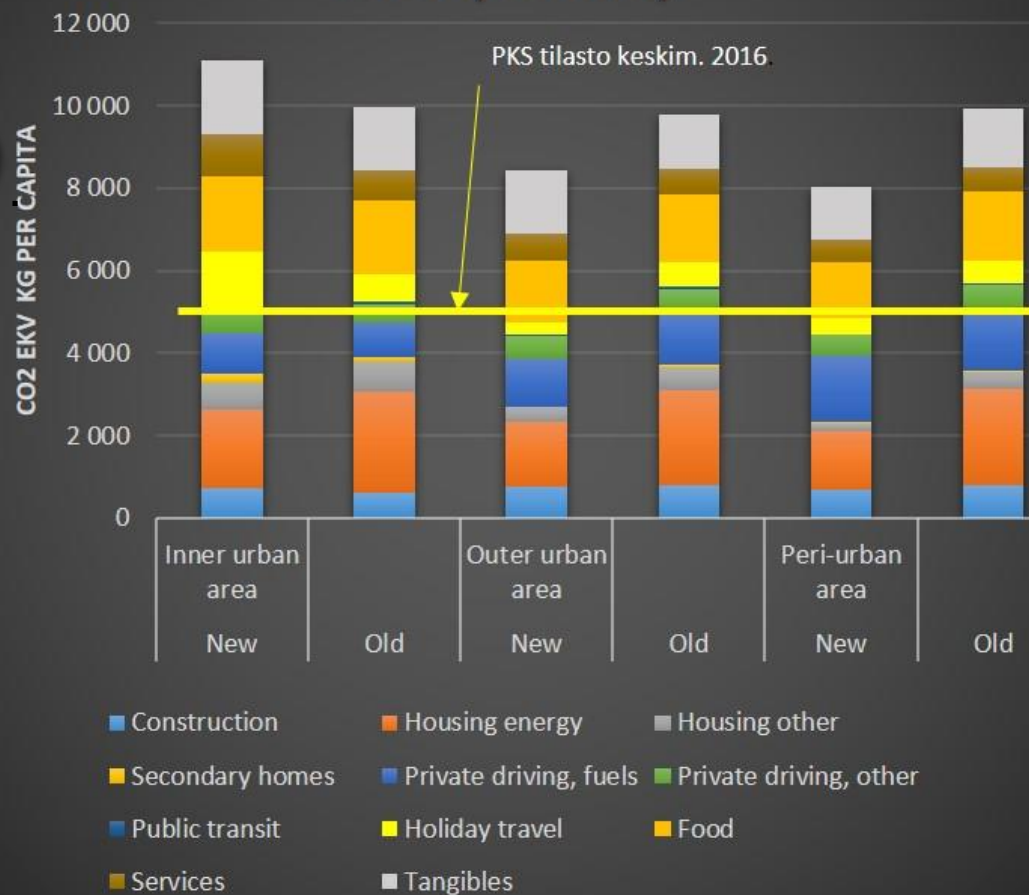


Yearly Energy Consumption related to Transport [GJ/inh]

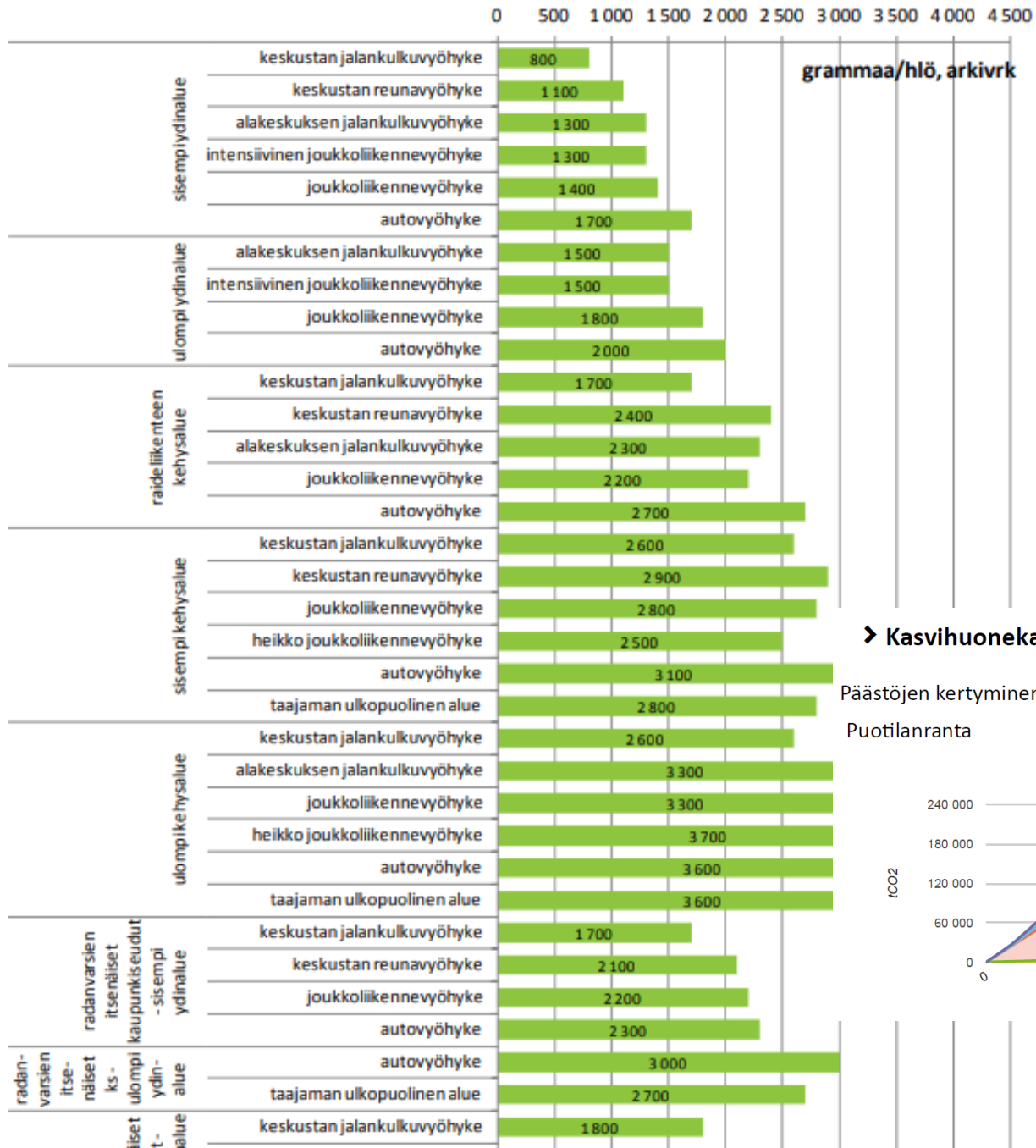


VS

### Hiilijalanjälki CO2 ekv kg per asukas 2014 (Junnila)

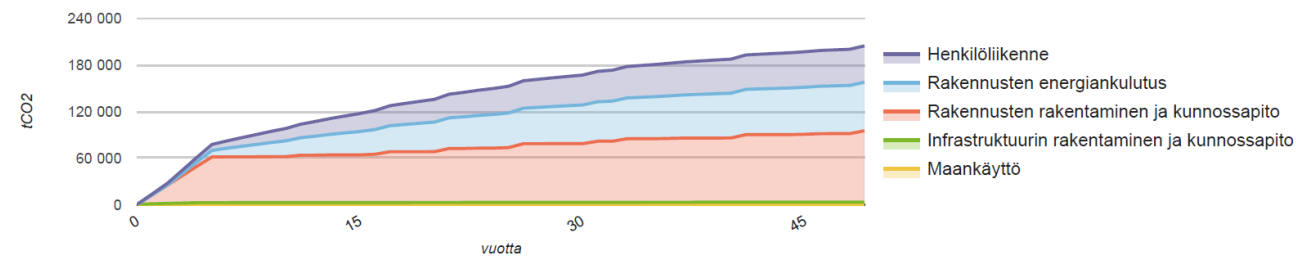






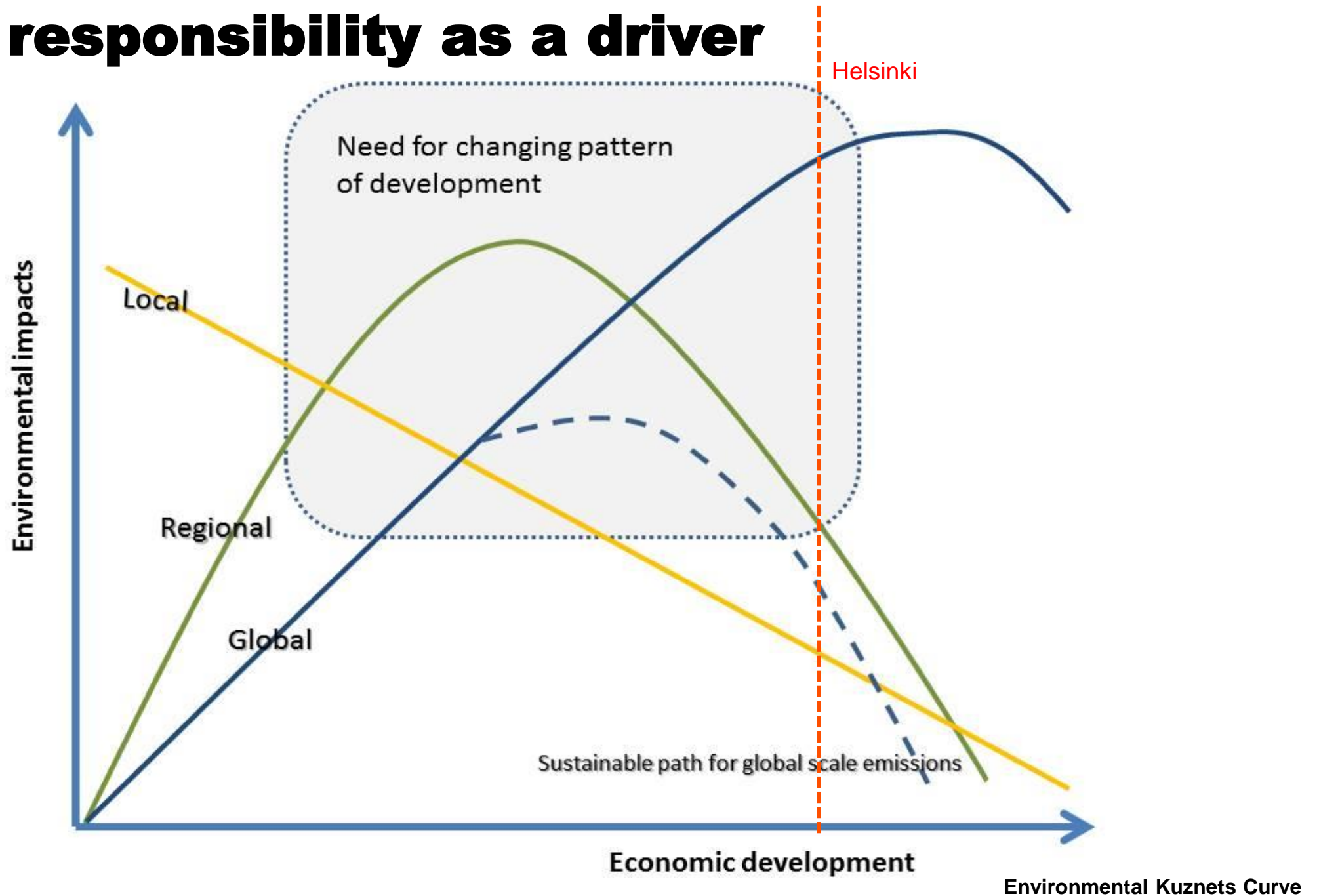
### ➤ Kasvihuonekaasupäästöjen kumulatiivinen kertyminen 50 vuoden aikana

Päästöjen kertyminen 50 vuoden aikana keskimääräisten päästökertoimien mukaan  
Puotilanranta





# Global responsibility as a driver



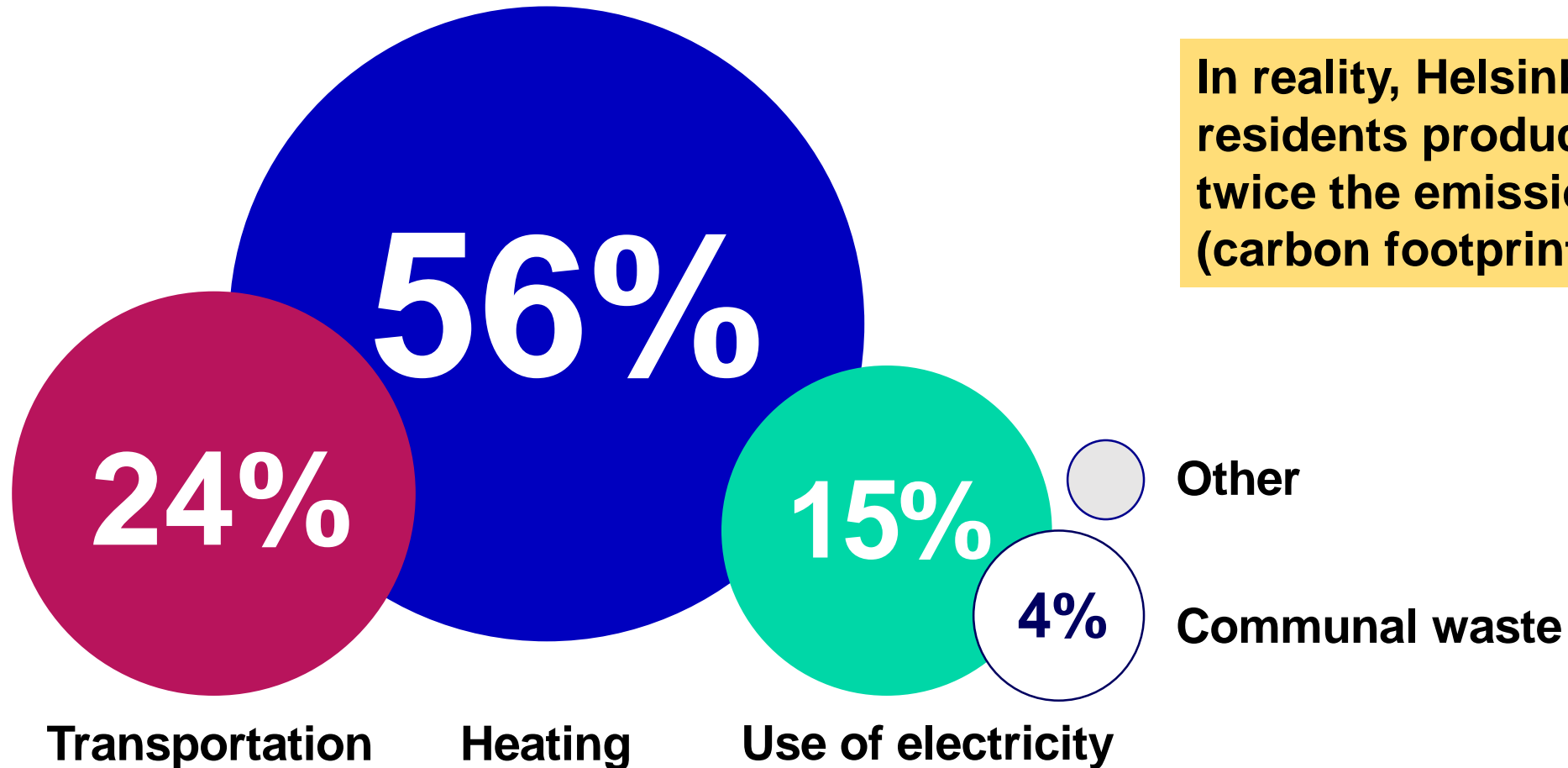
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# Carbon-neutral Helsinki 2035 Action Plan



# Where do Helsinki's GHG emissions come from?



In reality, Helsinki residents produce twice the emissions (carbon footprint)!



# Carbon-neutrality in practice, 2035

30 % electric cars and plug-in hybrids (currently 0,7 %)

Total heat consumption -20 % from today

15 % solar power (0,1 %)

15 % of the consumption by heat pumps (geoenergy)  
(0,5 %)

Carbon-neutral districts – planning has to start now!

# Planning of the carbon neutral future

Rising themes of carbon neutrality

- Carbon sinks
- Global responsibility
- Enabling - forcing – preventing
- Stronger regional perspective
- Focus on existing urban fabric
- Relation to growth and consumerism
- Embodied carbon and circular economy

Big challenges for planning system ahead!