

# Result analysis of supply side indicators for Odyssee – the Finnish and Dutch case

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# Overview

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- Description of the final methodology
- Changes compared to the methodology as proposed earlier
- New indicators and decomposition options
- Results for Finland and the Netherlands
- Conclusions

# Description of the final methodology – 1/4

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- Goals: efficiency indicators for the power sector and decomposition of electricity and CHP generation into volume, structural and efficiency effects
- Efficiency for water, wind and solar = 100%, for nuclear 33.3%
- Efficiency calculations for six fuel categories:
  - solid fuels
  - oil products
  - residual gases
  - natural gas
  - biofuels and renewable waste
  - non-renewable waste and other
- We use the Eurostat convention where all electricity generation and CHP is part of a single power sector

# Description of the final methodology – 2/4

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- Separate Eurostat CHP data are used for the fuel input and generation of heat and electricity for CHP (see <http://ec.europa.eu/eurostat/web/energy/data> at the end of the page, below ‘Combined heat and power generation (CHP)’)
- Fuel input for electricity-only generation is derived from
  - The amount of non-CHP electricity generated (= total electricity generation from main Eurostat database – CHP electricity generation from separate Eurostat CHP database)
  - The efficiency of electricity-only generation is based on data for main activity electricity-only data from the main Eurostat database
- The total volume of electricity generated is as available from the main Eurostat database
- The total fuel input will differ from the total input in the main Eurostat database because of the methodology used, and is corrected for missing fuel input for unsold CHP heat

# Description of the final methodology – 3/4

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- Energy savings of CHP generation are calculated by comparing the actual fuel input to the fuel input needed for separate electricity and heat generation using the same fuel
- Using a variant of the Finnish method, the savings are split between electricity and heat generation, weighed by electricity and heat production quantities
- The fuel inputs for heat and electricity generation are calculated as (the input needed for separate generation) – (the weighed savings)
- Both of the resulting electricity and heat generation efficiencies will be higher than efficiencies for separate generation
- Heat generation efficiencies may become higher than 100%

# Description of the final methodology – 4/4

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- National teams will have the option to overrule the default Eurostat data in the future Odyssee country data sheet for:
  - Electricity only generation: fuel input and electricity generated per fuel category
  - CHP (fuel inputs attributed to electricity and heat, and electricity and heat production, all per fuel category)

# Changes compared to the methodology as proposed earlier

- **Not applied anymore:** estimating unsold heat by autoproducer CHP using a standard ratio of produced heat vs electricity per generation type

heat/electricity				
	main activity		autoproducers	
solid-fuels	0,5	heat extraction	3,0	backpressure turbine
oil-products	0,5	heat extraction	3,0	backpressure turbine or motor
gases	1,0	heat extraction/combined cycle	2,0	gas turbine
waste and other	2,0	gas turbine	2,0	backpressure turbine or gas turbine
biofuels	1,0	motor	1,0	motor

- Unsold heat is included in the separate Eurostat CHP database, and we want to minimize the number of estimated values

# New indicators and decomposition options

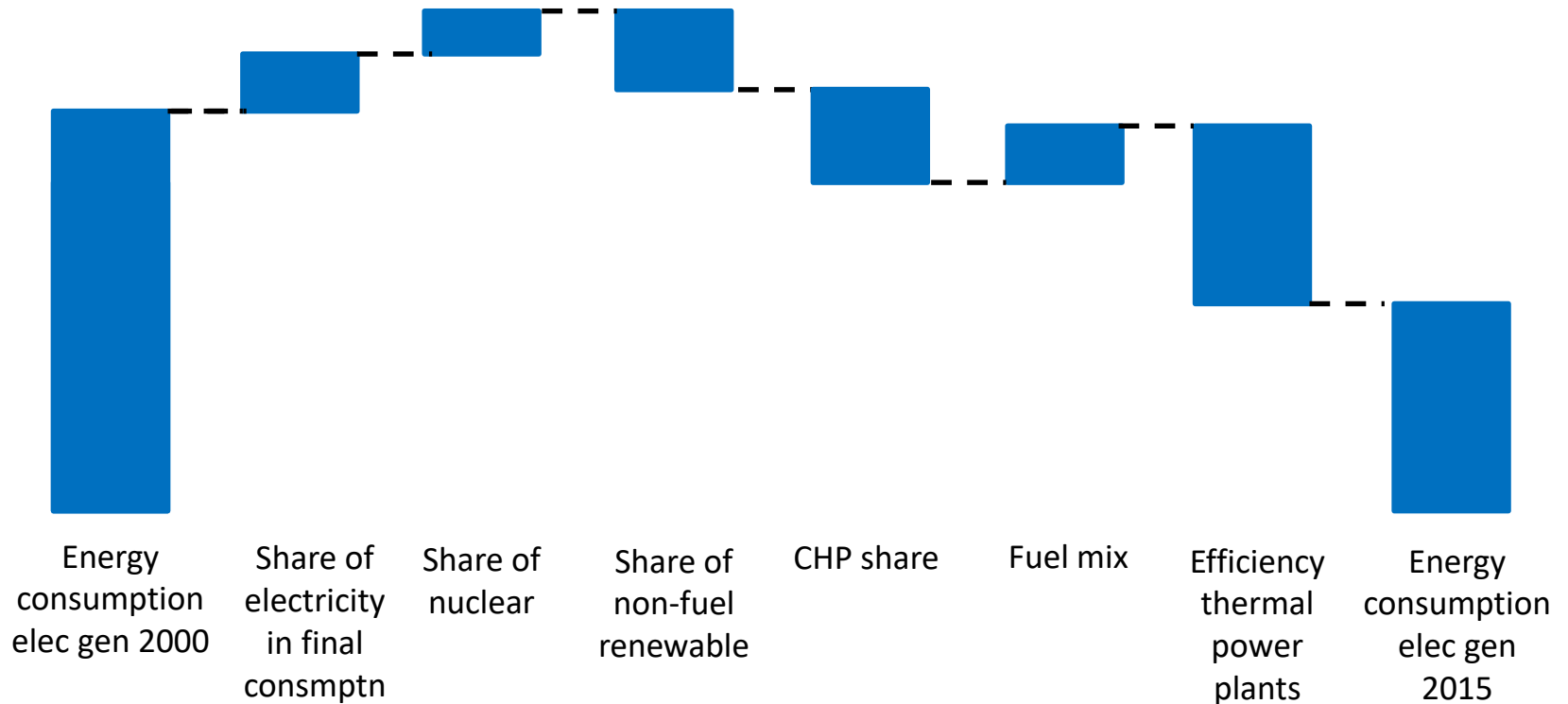
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- New indicators will become available in the Odyssee database:
  - The share of non-combustible renewables in electricity generation (water, wind, solar)
  - The share of nuclear
  - The share of the different combustible fuels
  - Efficiencies of heat and electricity generation per fuel category
  - Share of CHP generation
- More detailed decomposition

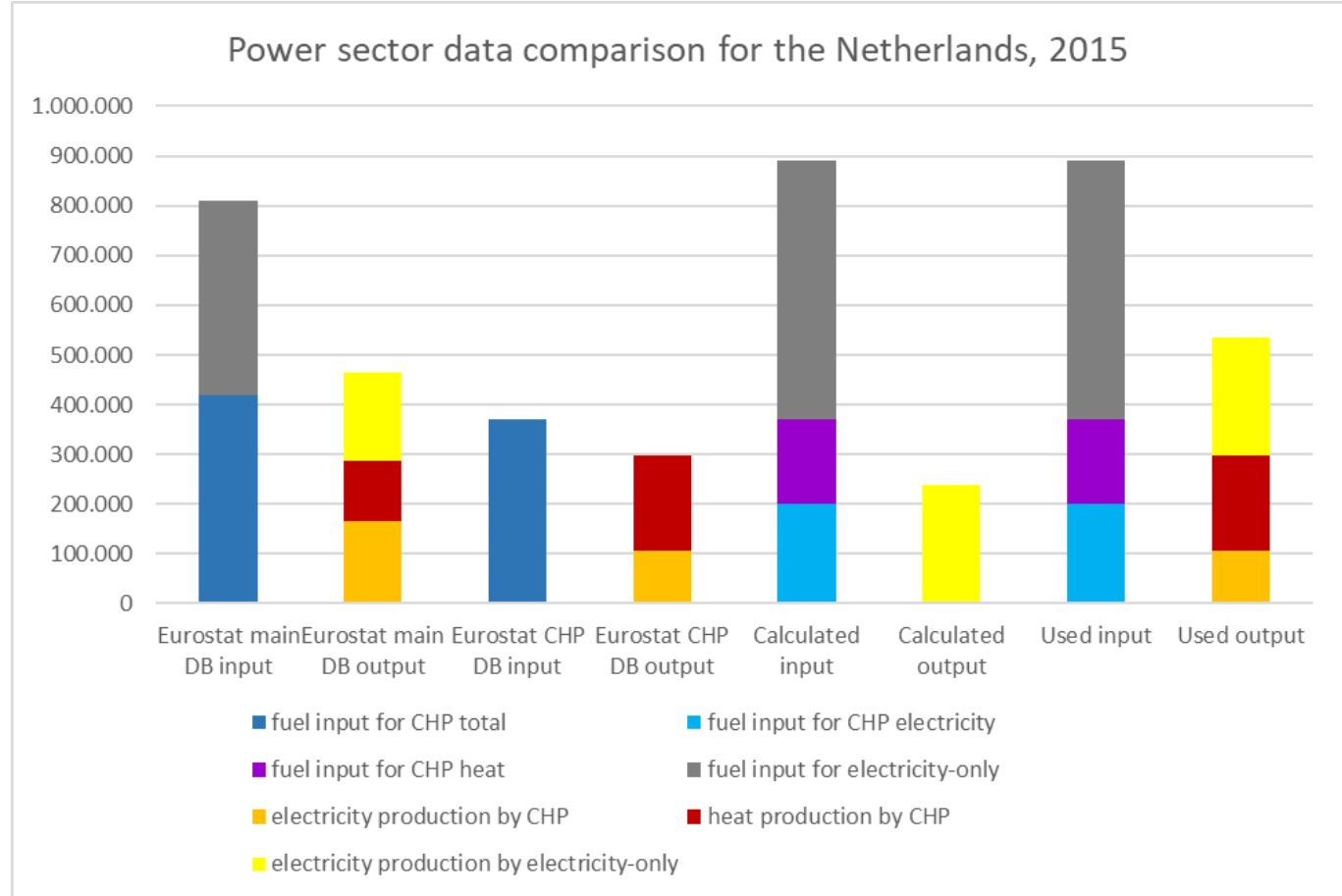


# Extended decomposition

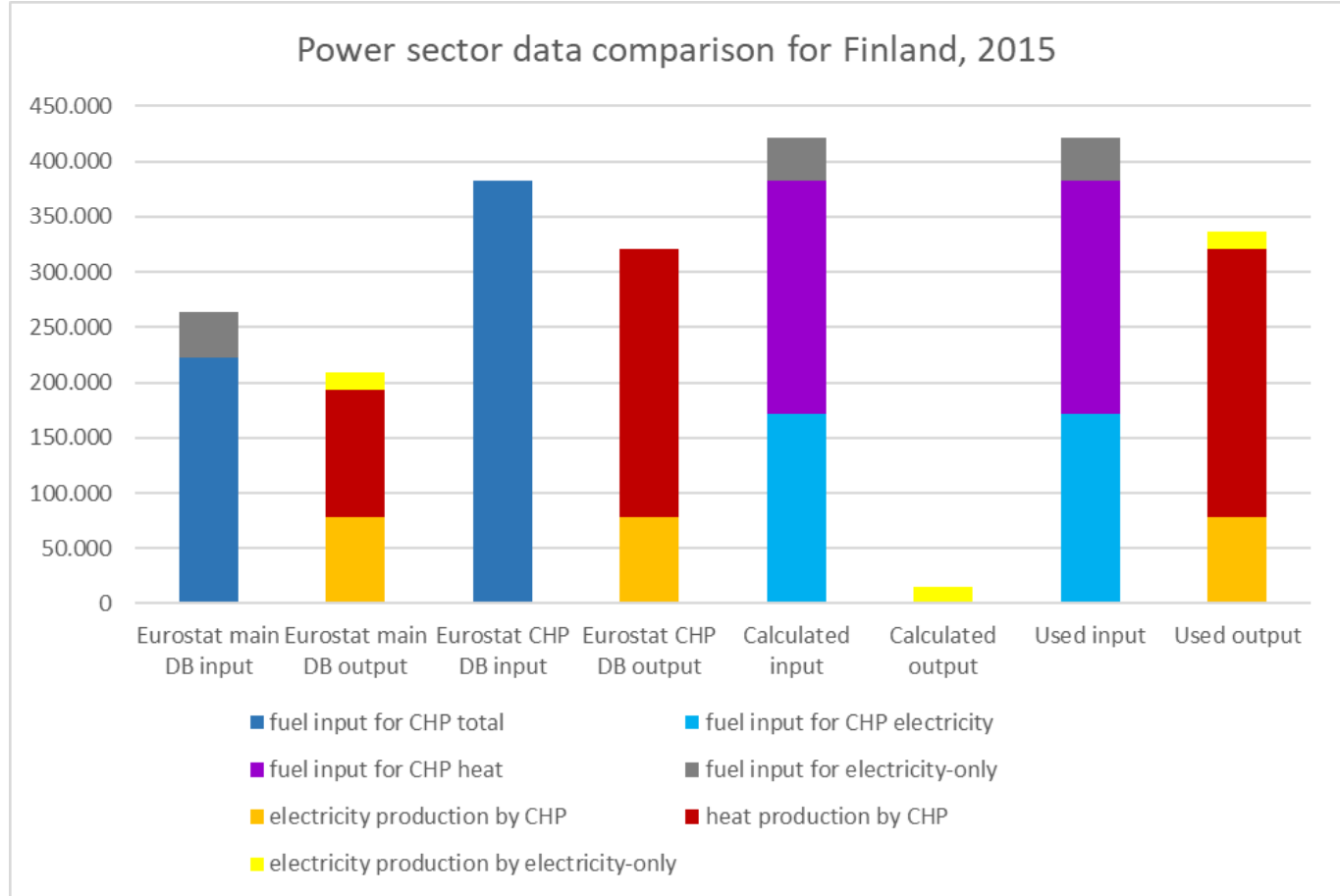
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# Power sector data comparison for the Netherlands, 2015

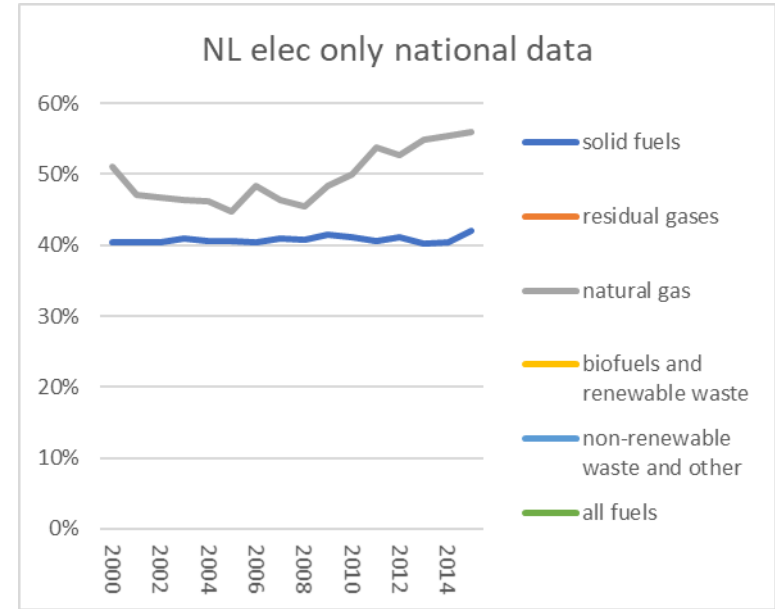
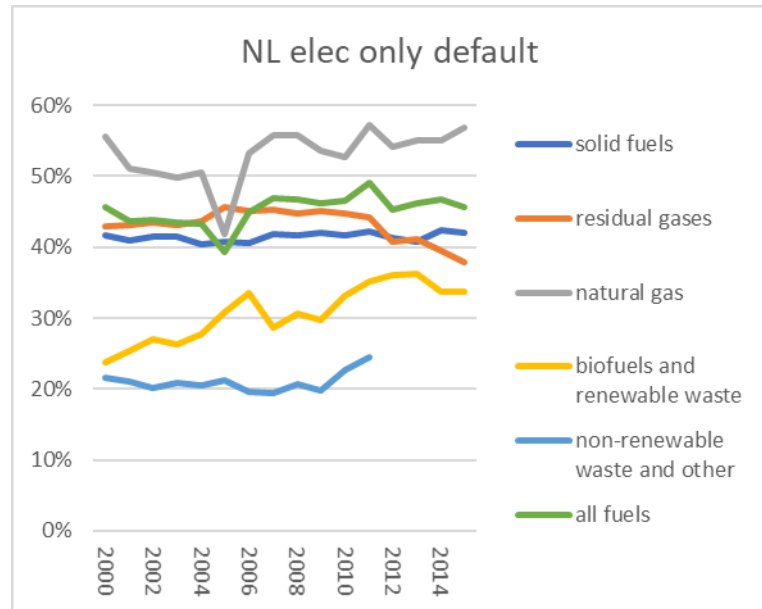


# Power sector data comparison for Finland, 2015



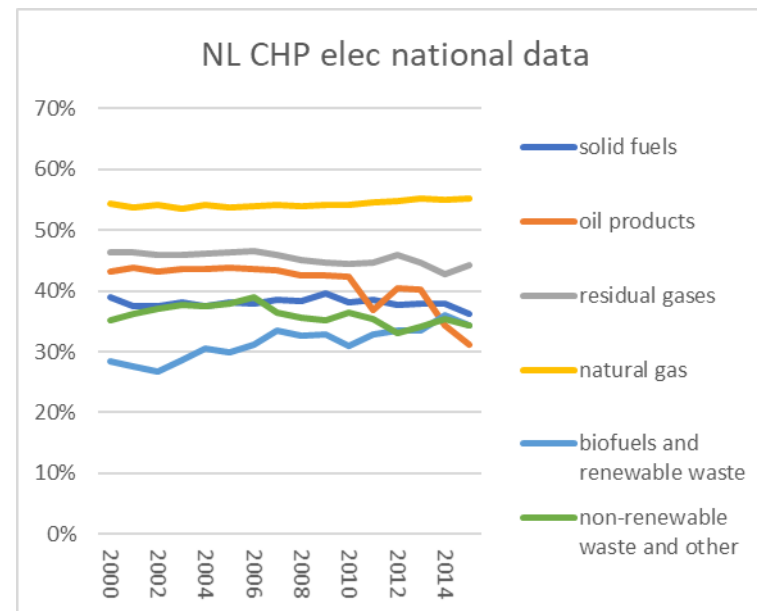
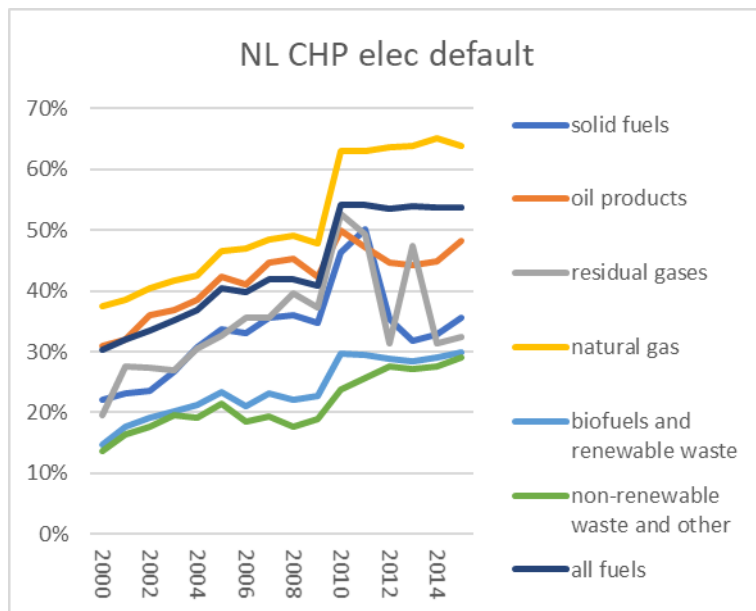
# Results – Netherlands electricity only efficiencies

- Default (Eurostat) and national data: coal OK, natural gas OK from 2010



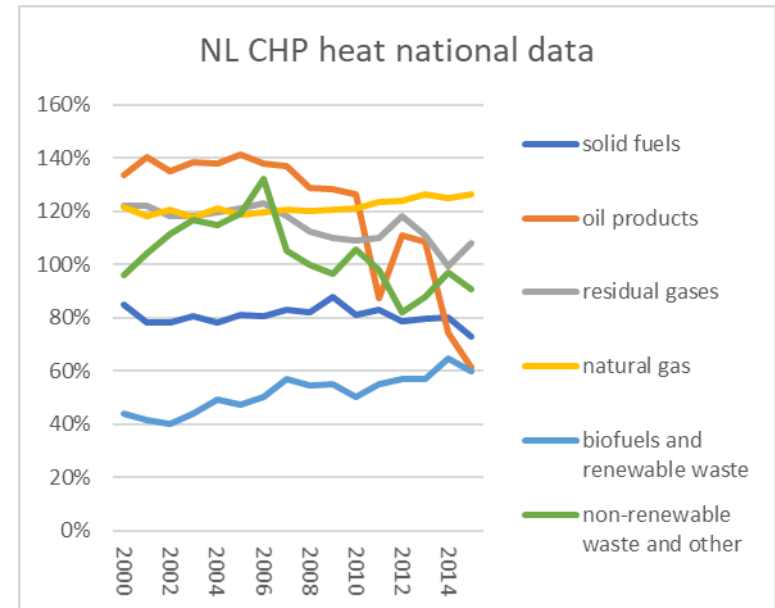
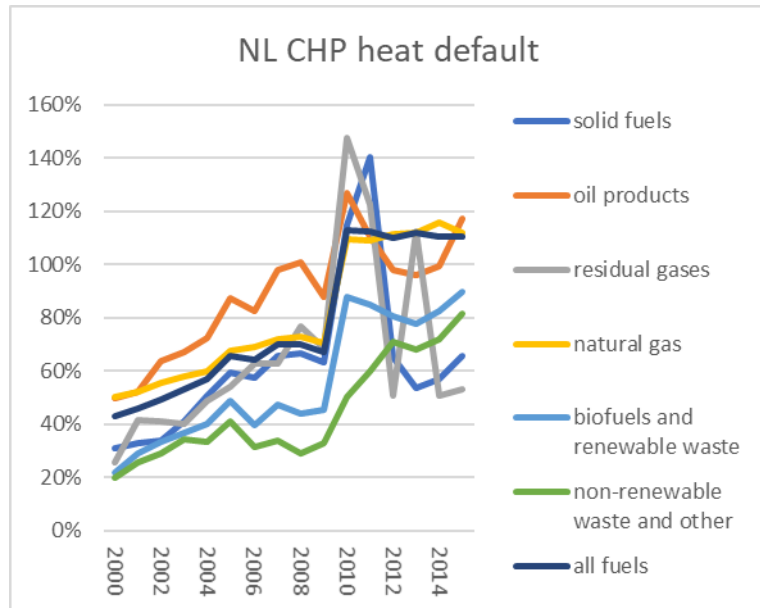
# Results – Netherlands CHP electricity efficiencies

- Default (Eurostat) data: big trend change in 2010; explanation still to be discussed with Statistics Netherlands. Too many installations reported as CHP before 2010?
- National data: stable, but not very accurate due to missing generation data per fuel (efficiencies per fuel estimated using total electricity generation)



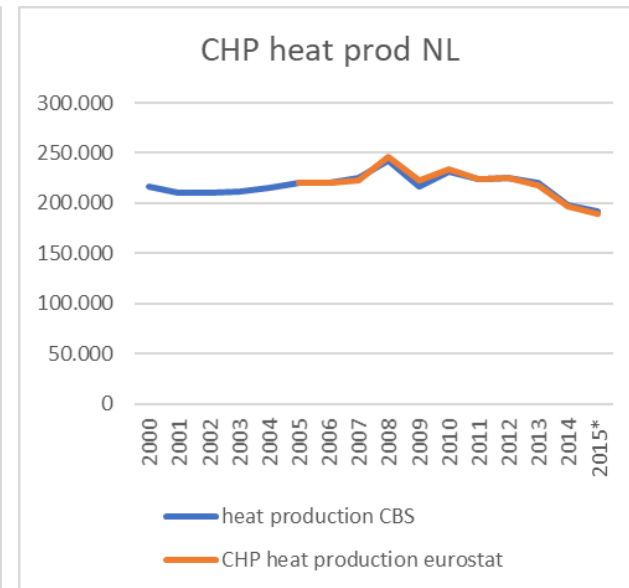
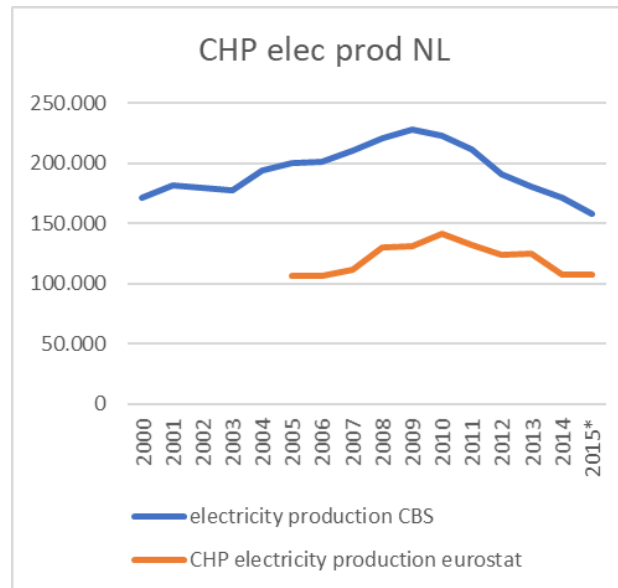
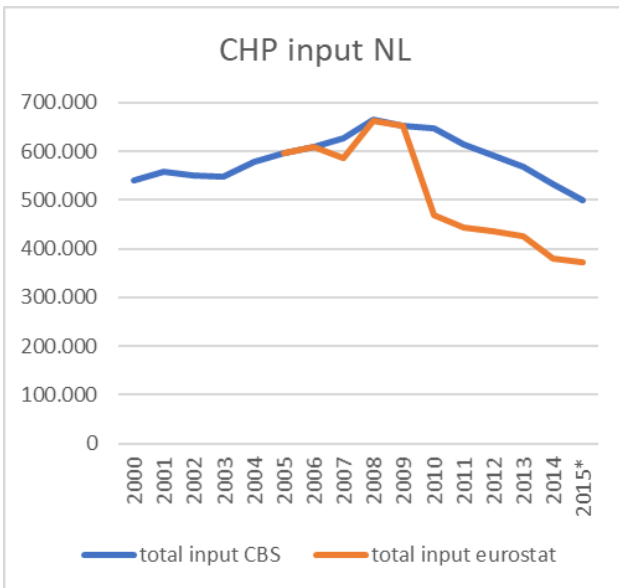
# Results – Netherlands CHP heat efficiencies

- Default (Eurostat) data: big trend change in 2010; too many installations reported as CHP before 2010?
- National data: stable, but not very accurate due to missing generation data per fuel (efficiencies per fuel estimated using total heat generation)



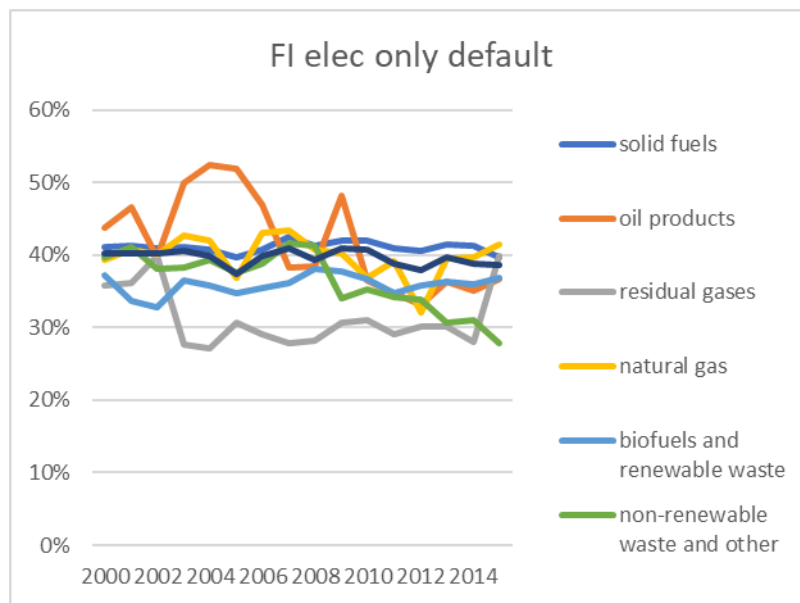
# Results – Netherlands default and national CHP data

- Heat data consistent, national CHP electricity production and input data too high
- Only more recent Eurostat input data have been adjusted



# Results – Finland electricity only efficiencies

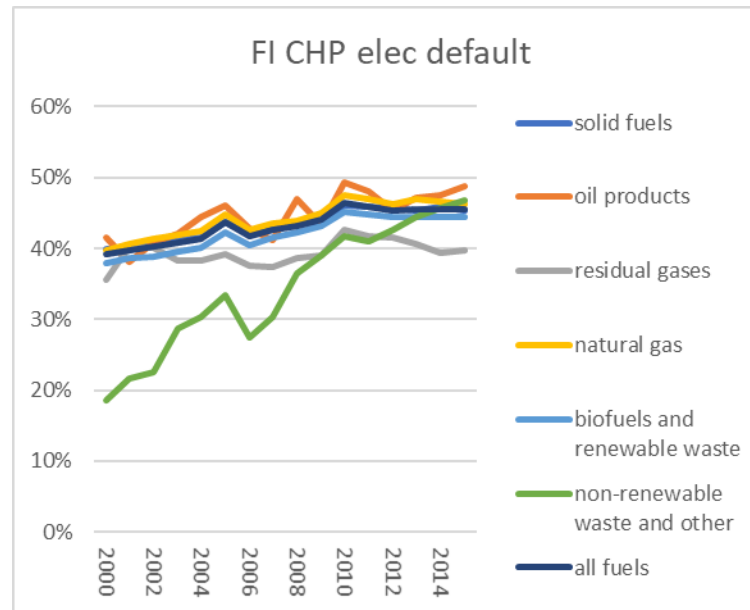
- Default (Eurostat) data: relatively stable efficiencies





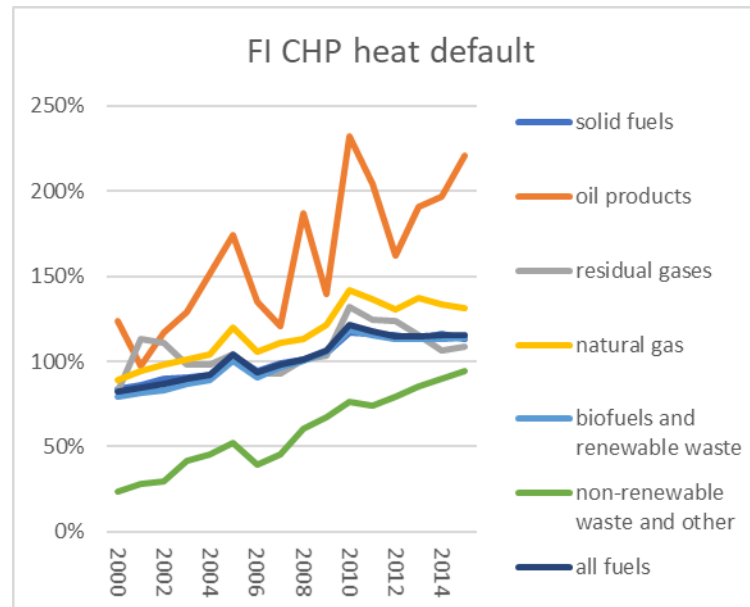
# Results – Finland CHP electricity efficiencies

- Default (Eurostat) data: stable efficiencies



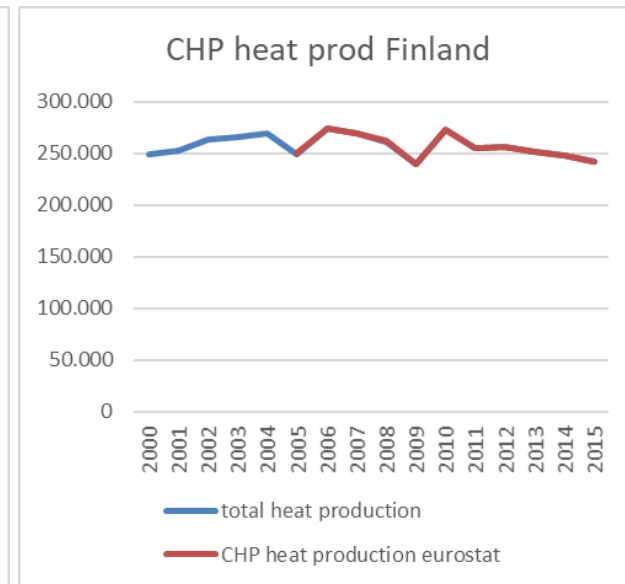
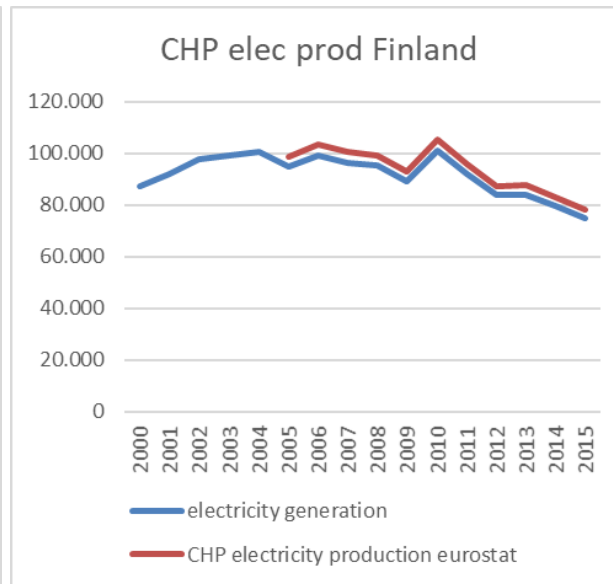
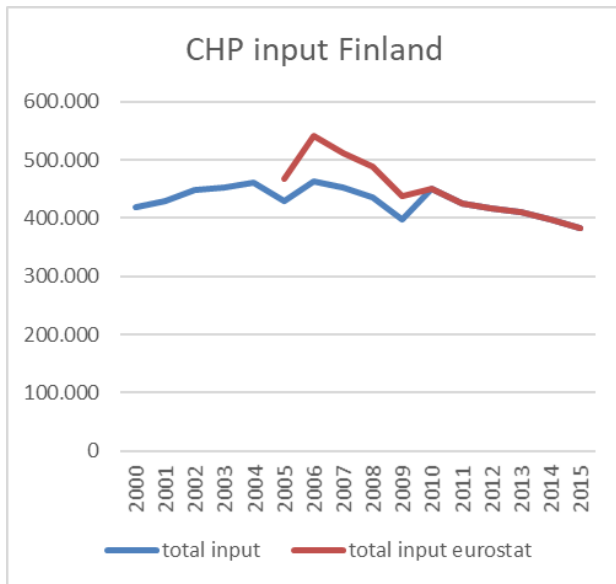
# Results – Finland CHP heat efficiencies

- Default (Eurostat) data: stable efficiencies for the important fuels

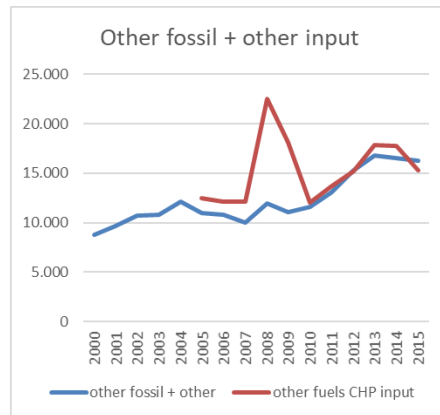
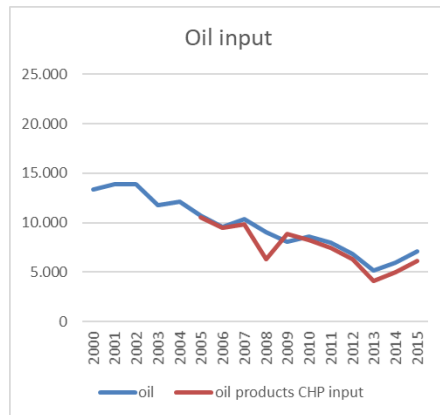
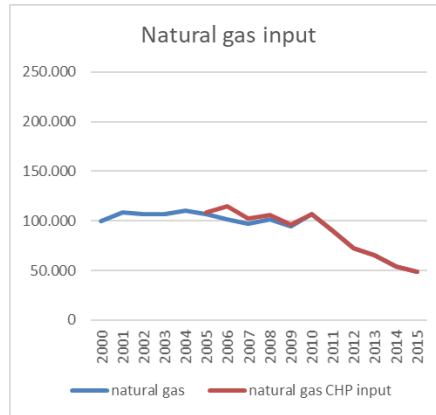
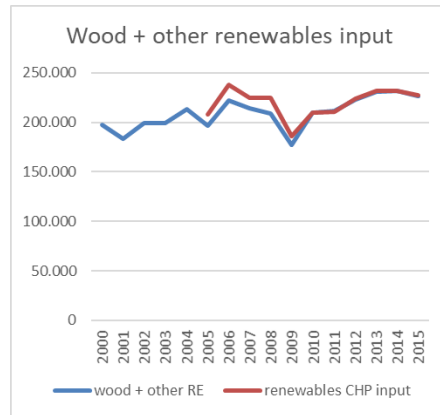
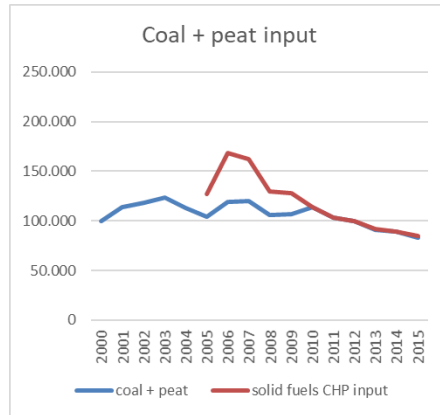


# Results – Finland default and national CHP data

- Heat production consistent, electricity production good consistency, inconsistent fuel input before 2010



# Results – Finland default and national CHP data



# Conclusions

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- This seems the best possible methodology using Eurostat data
- Accuracy of default results based on Eurostat data depends on data submission by national statistics bureaus to Eurostat
- The definition of what part of electricity to report as CHP electricity is probably behind inconsistencies between the main Eurostat database and the Eurostat CHP database
- Results for some countries (like the Netherlands) are a reason to start a discussion with national statistics bureaus