



Mapping biomass value chains for improved sustainable energy use in the Baltic Sea Region

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PRESENTATION PLAN

1. **General concept**
2. **Assessment of biomass potential in selected sectors:**
 - General data
 - Forest biomass and agricultural biomass
 - Yields of the main crops and straw potential
 - Dedicated perennial crops plantations
 - Livestock and manure and slurry
 - Potential characteristics of municipal waste and sewage sludge
3. **Documented solutions for biomass use in the BSR countries:**
 - General data on bioenergy
 - Pellets
 - Residential heat production
 - Heat and cool
 - Bioelectricity
 - Liquid biofuels
 - Biogas
 - Incineration plants
 - Biorefineries
4. **Conclusion**

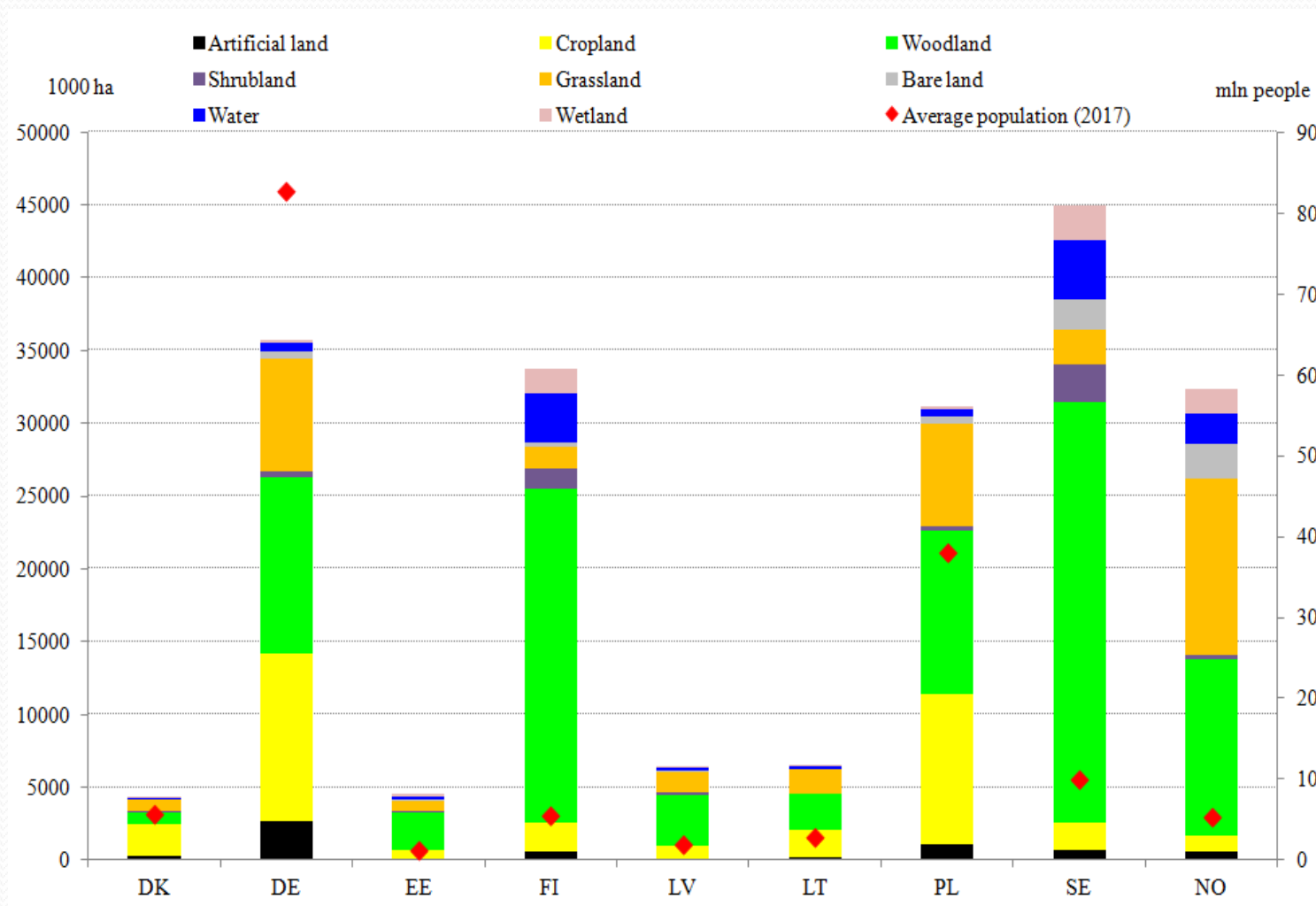
General concept of biomass value chains mapping for improved sustainable energy use in BSR

- Assessment of biomass potential and biomass logistics from different sources (agriculture, food and feed industry, forestry, wood industry, municipal waste and sewage sludge, fishery, algae)
- Assessment of biomass conversion technologies, including thermo-chemical, physico-chemical and biological conversion.
- Provision of information about technological solutions (including pilot plants under implementation experience) from different BSR countries and comparable/neighbouring regions.
- Identification of different technological solutions, technology readiness level and the best bioenergy practices.



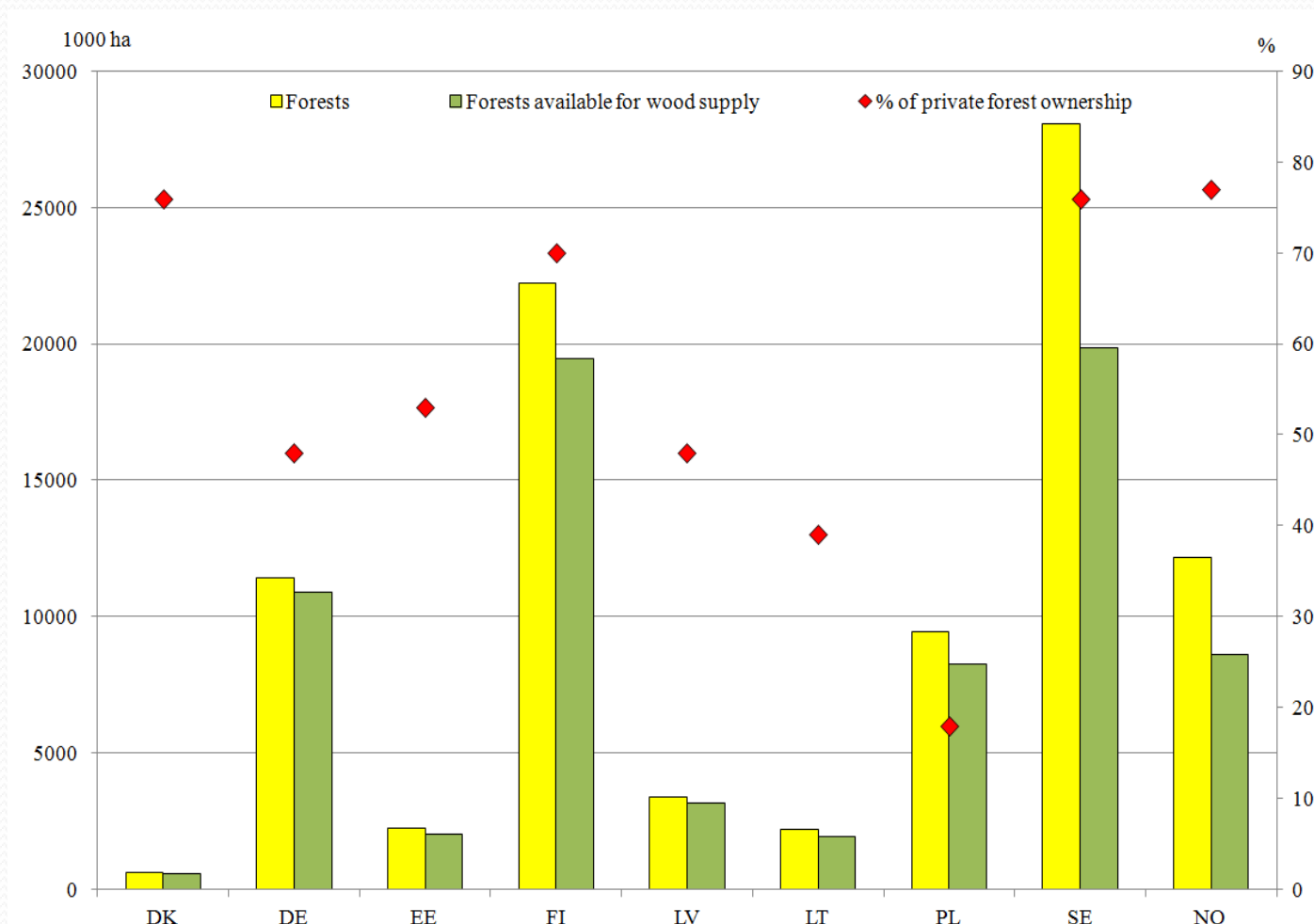
Assessment of biomass potential in selected sectors

Characterisation of land use and populations in the Baltic Sea Region (BSR) countries in 2017



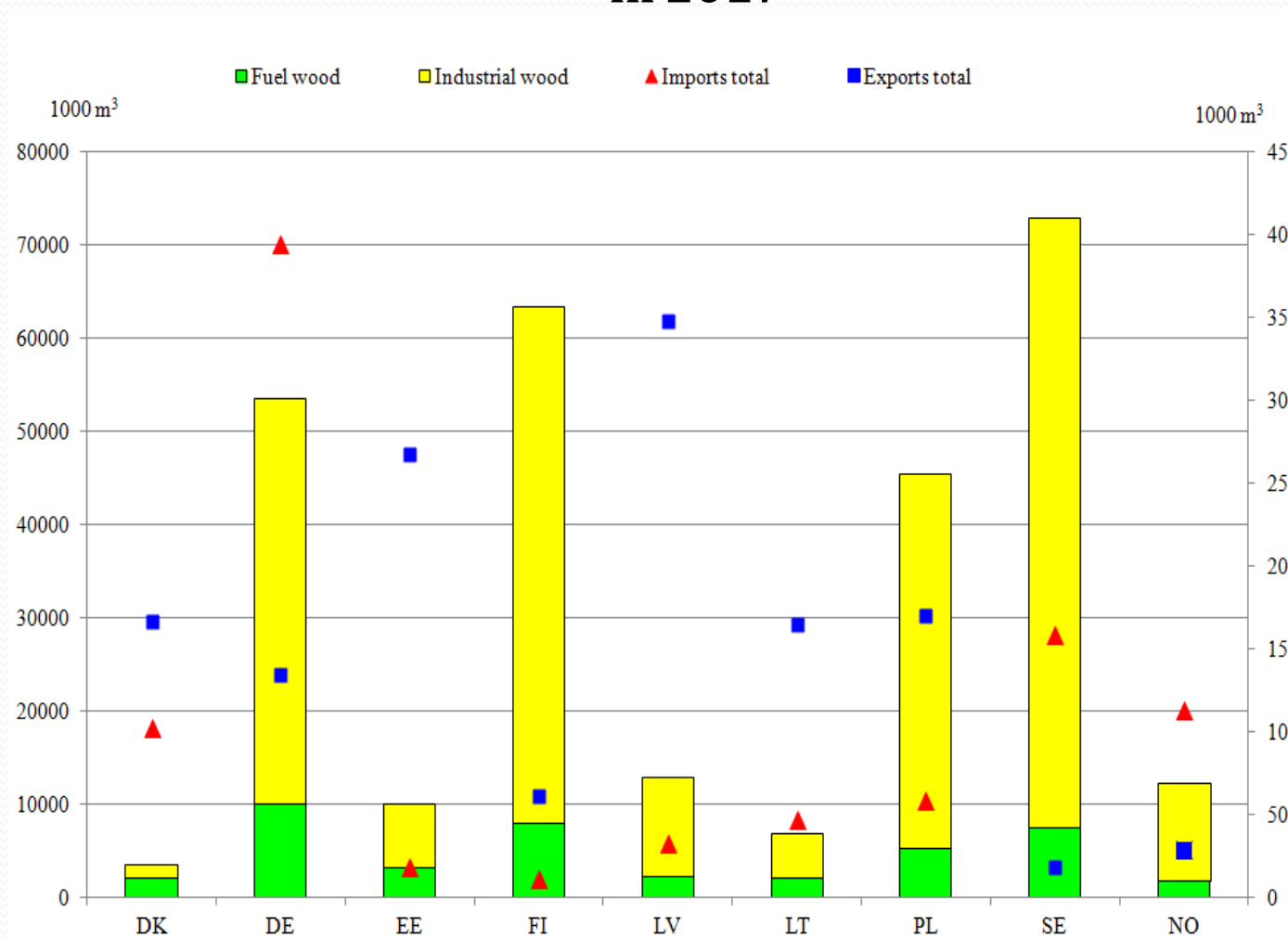
Source: Eurostat, 2019.

Forest area, forests available for wood supply and % of private forest ownership in 2017



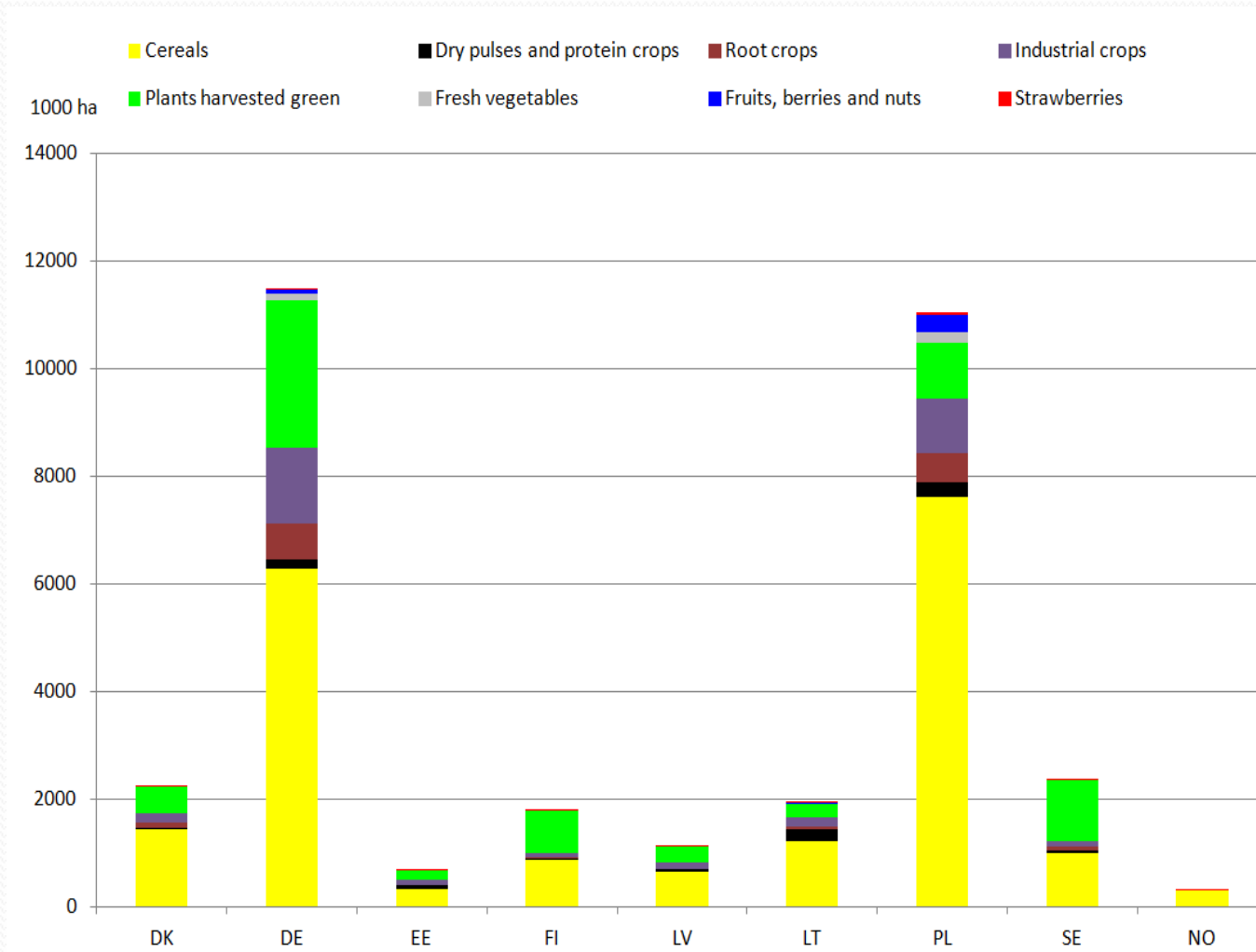
Source: Eurostat, 2019.

Fuel and industrial wood removals from forests and fuel wood import and export (including wood for charcoal) in BSR countries in 2017



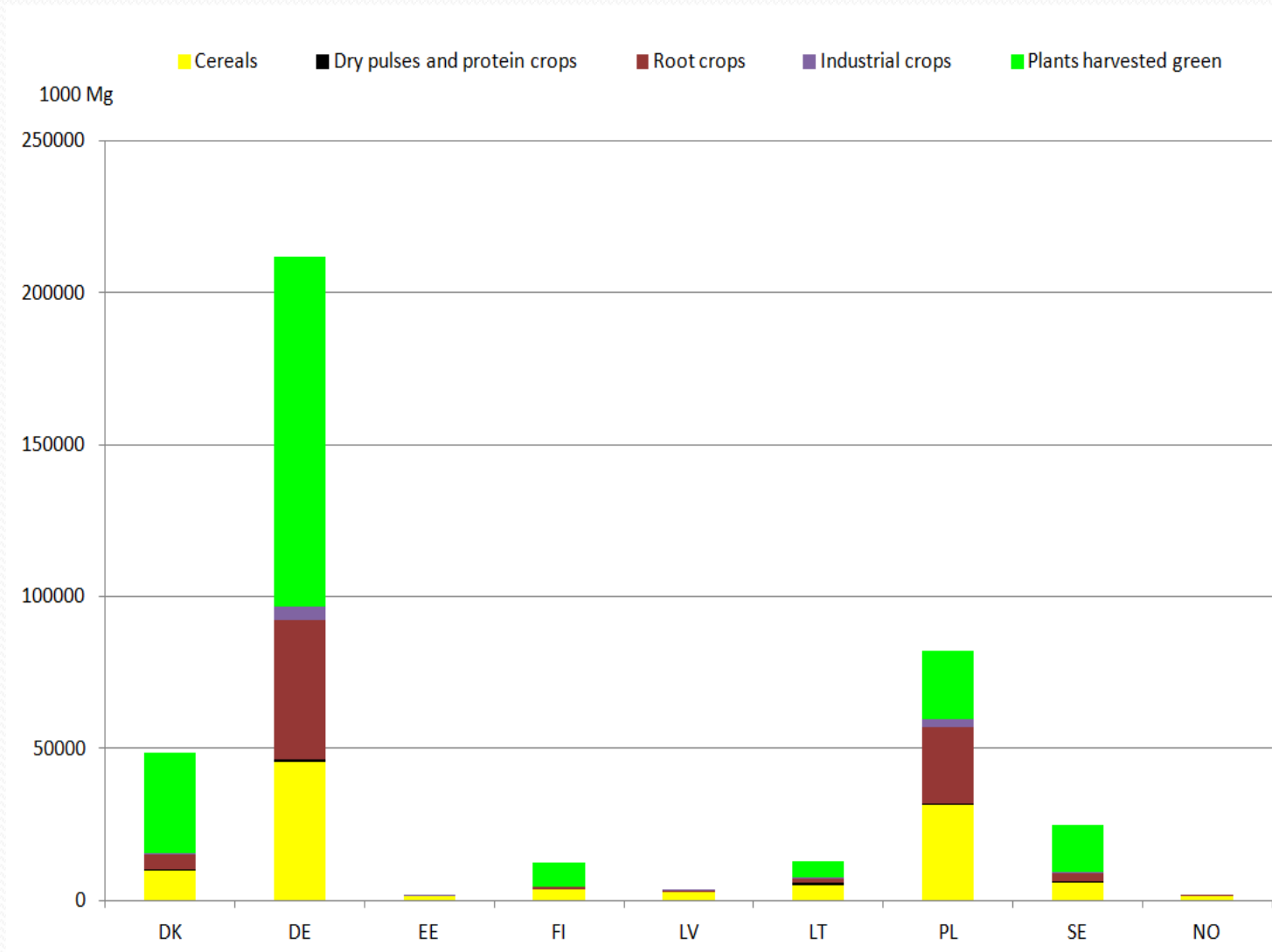
Source: Eurostat, 2019.

Area cultivation of major agricultural crops in the BSR countries in 2017 (1000 ha)



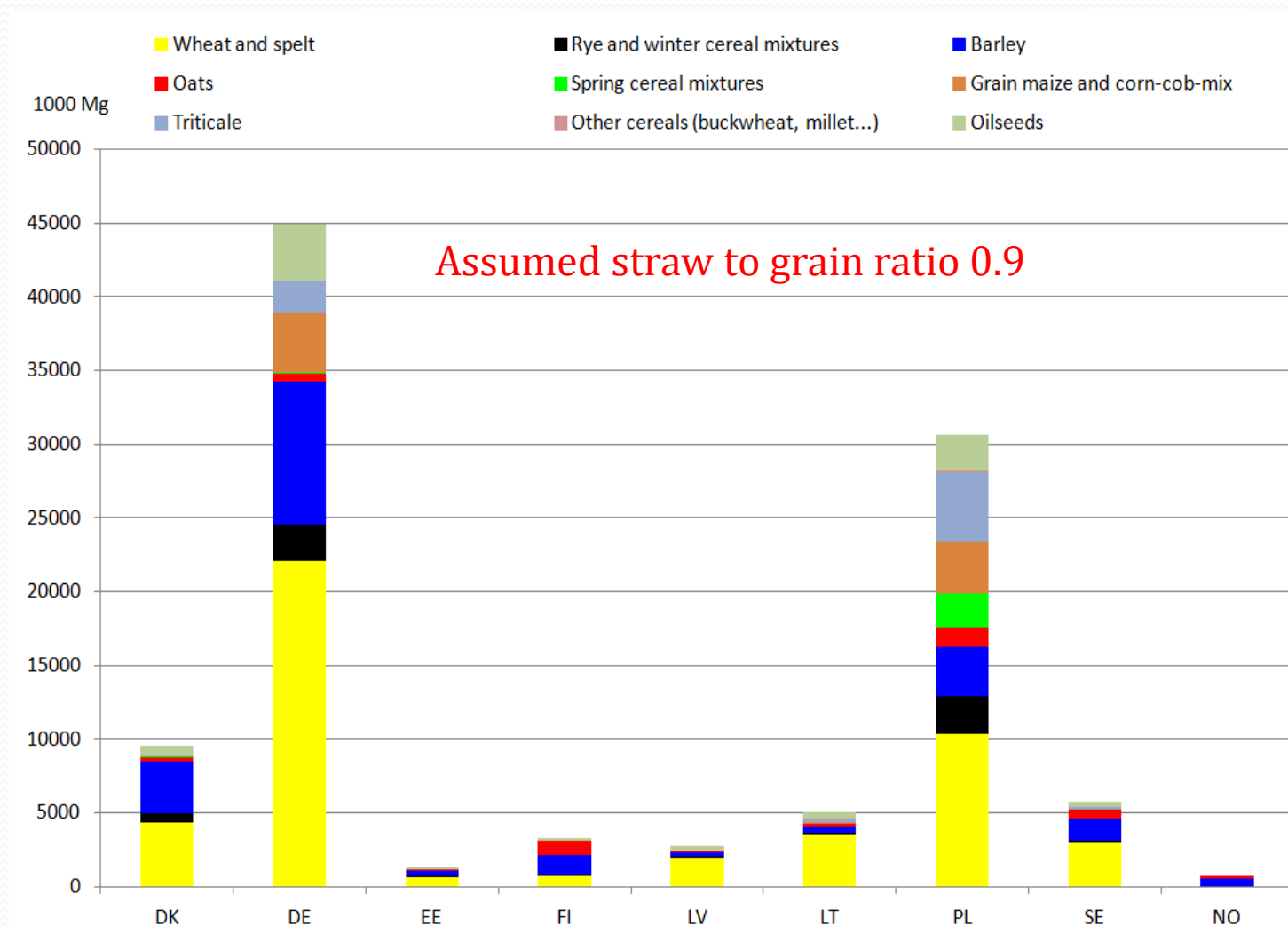
Source: Eurostat, 2019.

Major crop production in the BSR countries in 2017 (1000 Mg)



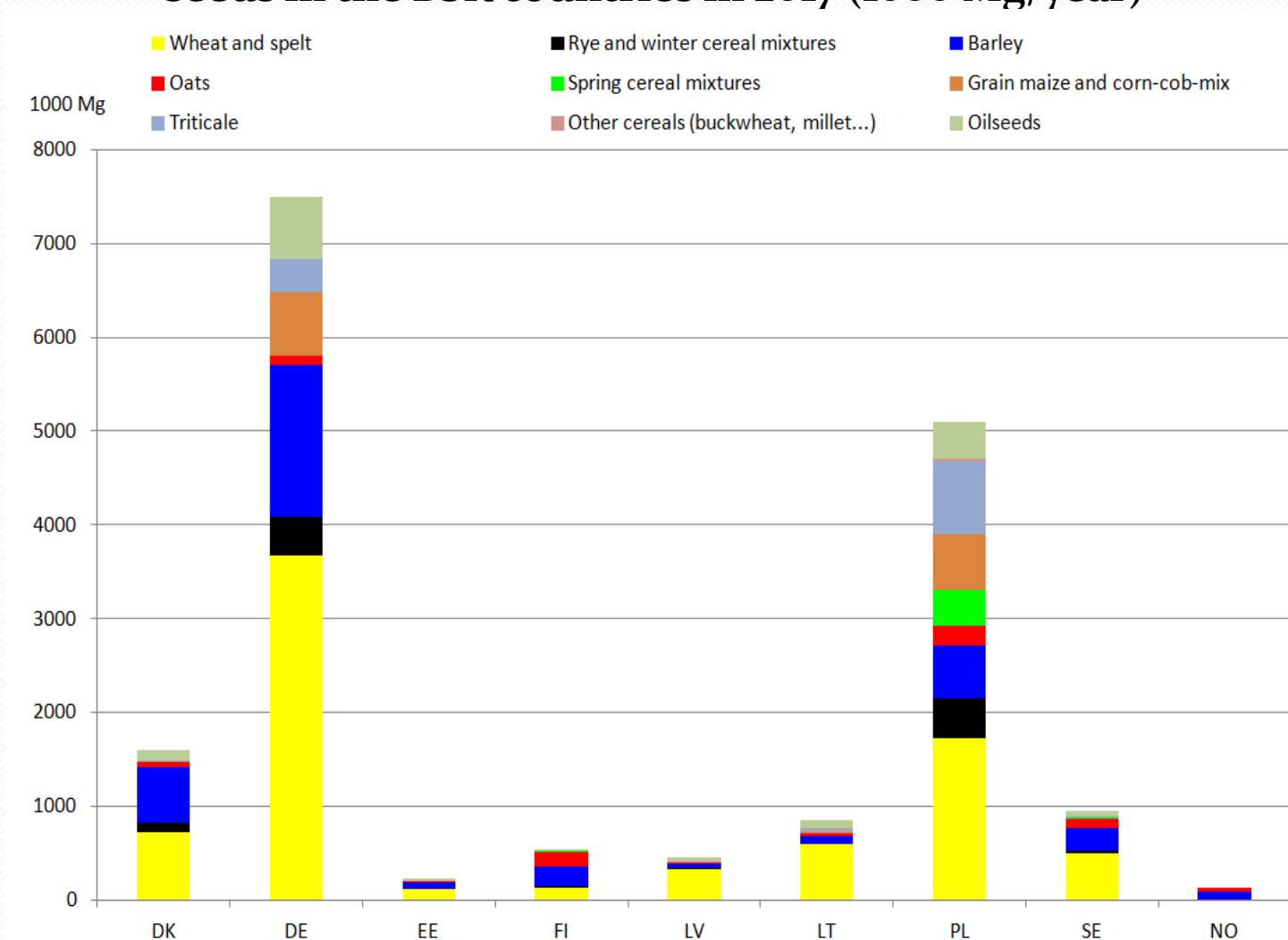
Source: Eurostat, 2019.

Theoretical straw potential from cereals and oil seeds production in the BSR countries in 2017 (1000 Mg/year)



Source: own calculations.

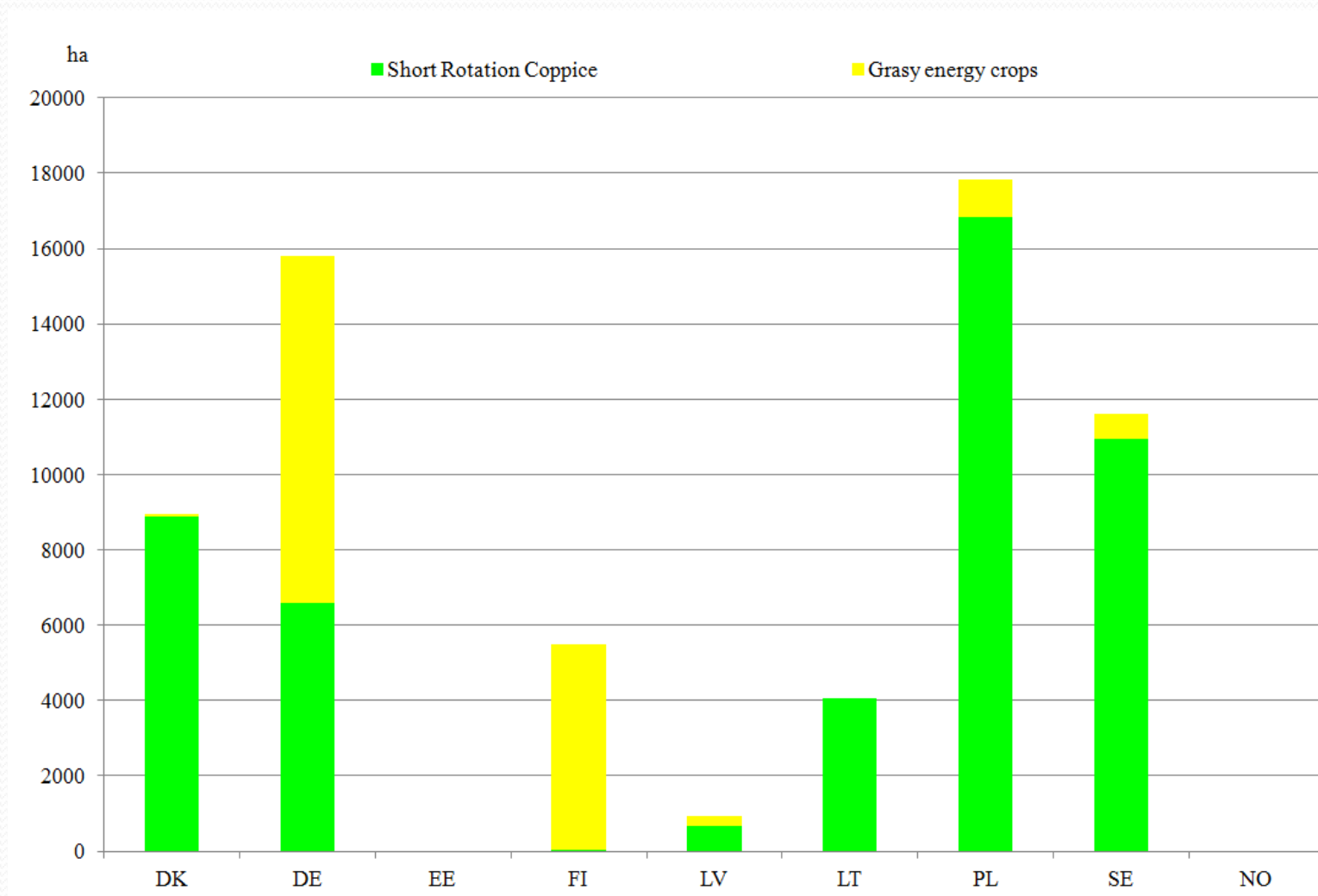
Technical straw potential for energy purposes from cereals and oil seeds in the BSR countries in 2017 (1000 Mg/year)



straw to grain ratio x amount of straw for bioenergy purposes (0.6 x 0.25)

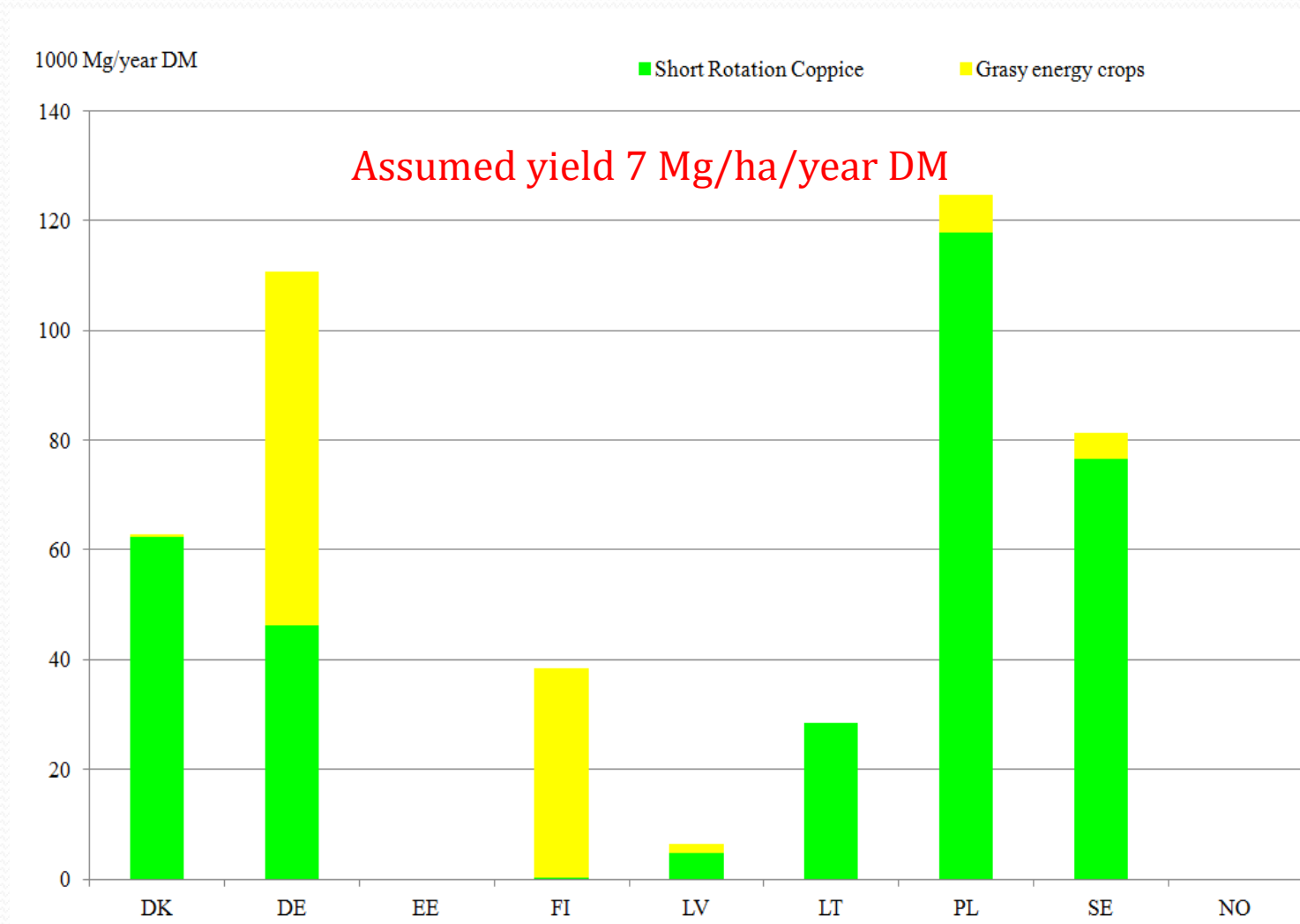
Source: own calculations.

Area of perennial energy crops in the BSR countries in 2017 (ha)



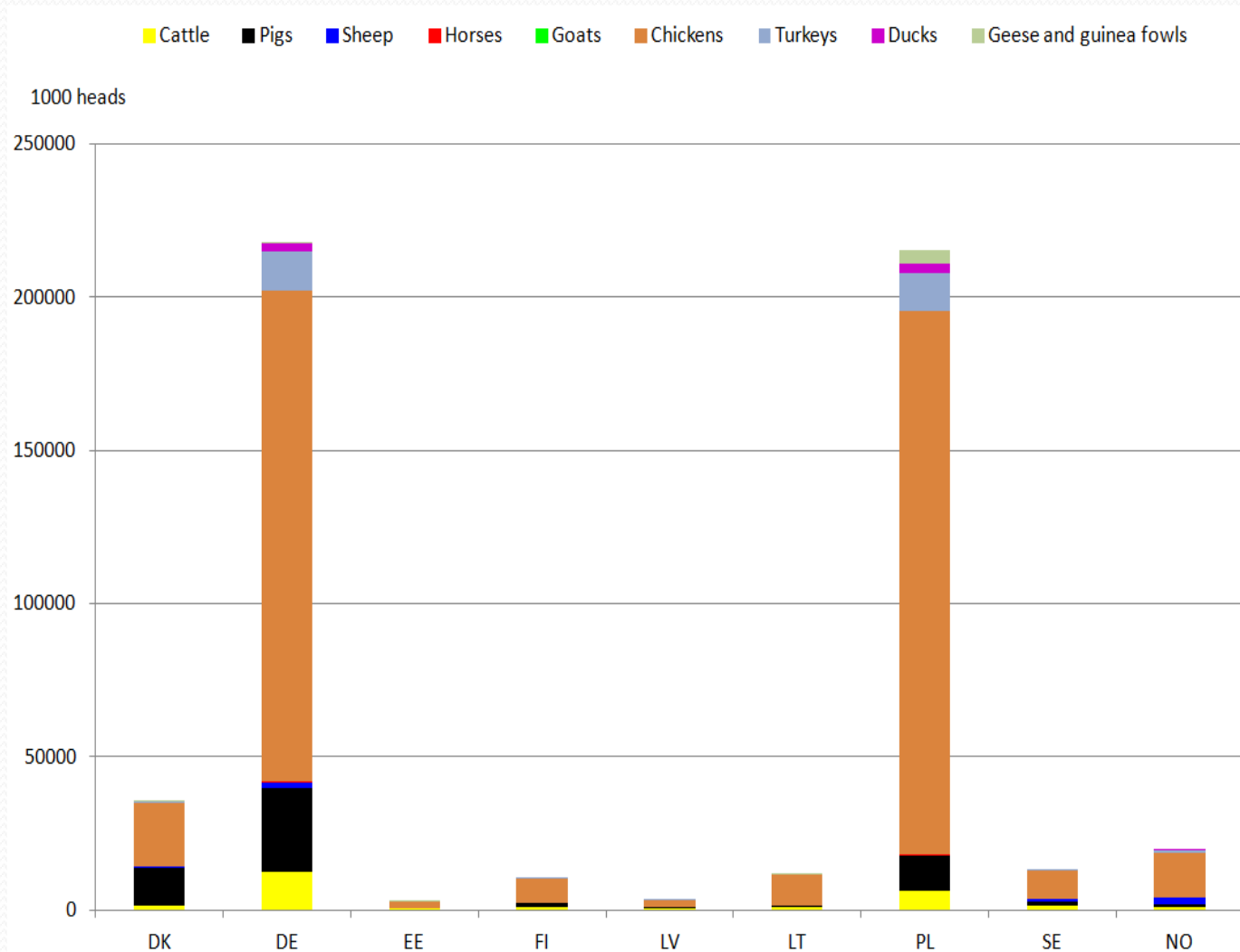
Source: Bioenergy Europe, 2019

Potential of biomass from perennial energy crops in the BSR countries in 2017 (1000 Mg/year)



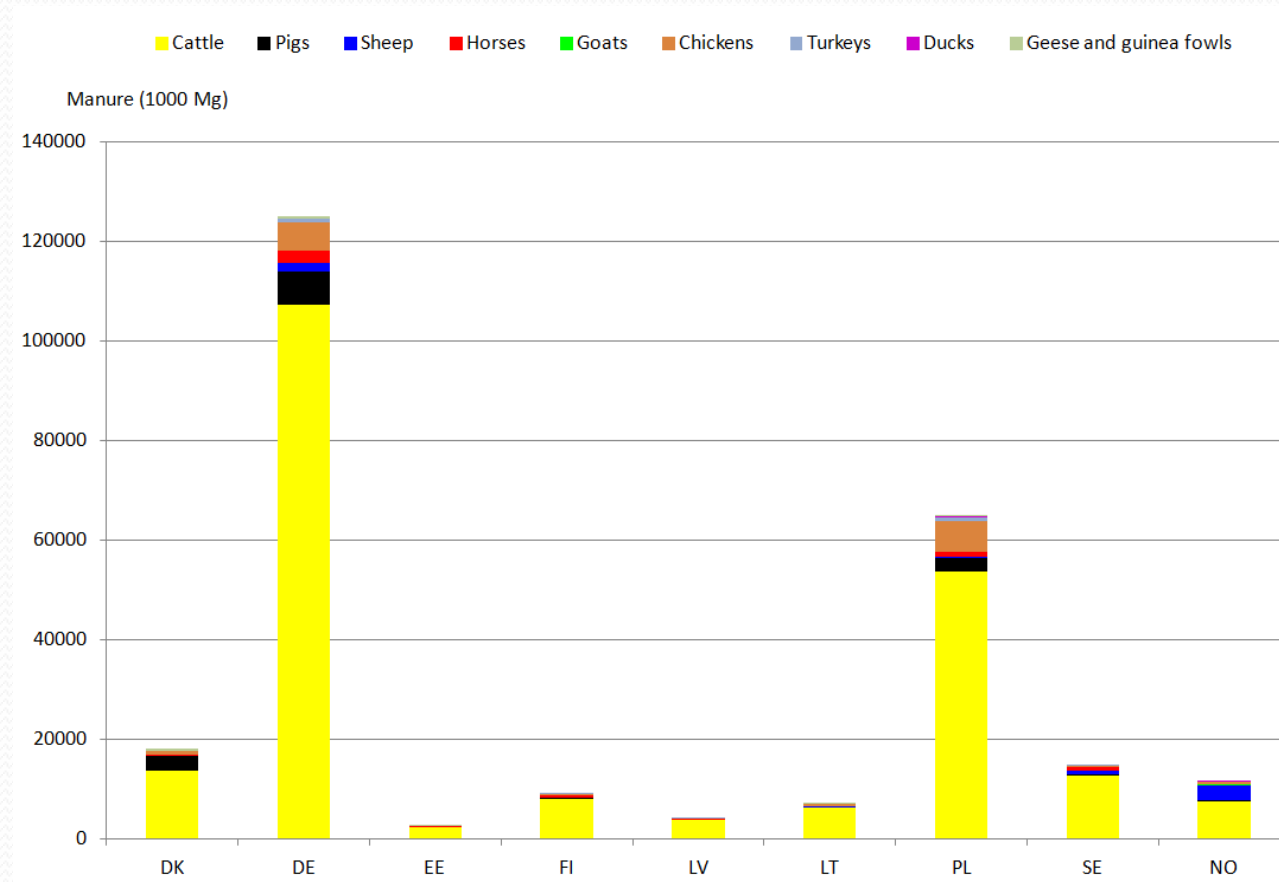
Source: own calculations.

Animals in the BSR countries in 2017 (1000 heads)



Source: FAO, 2019.

Theoretical manure potential in the BSR countries in 2017 (1000 Mg/year)

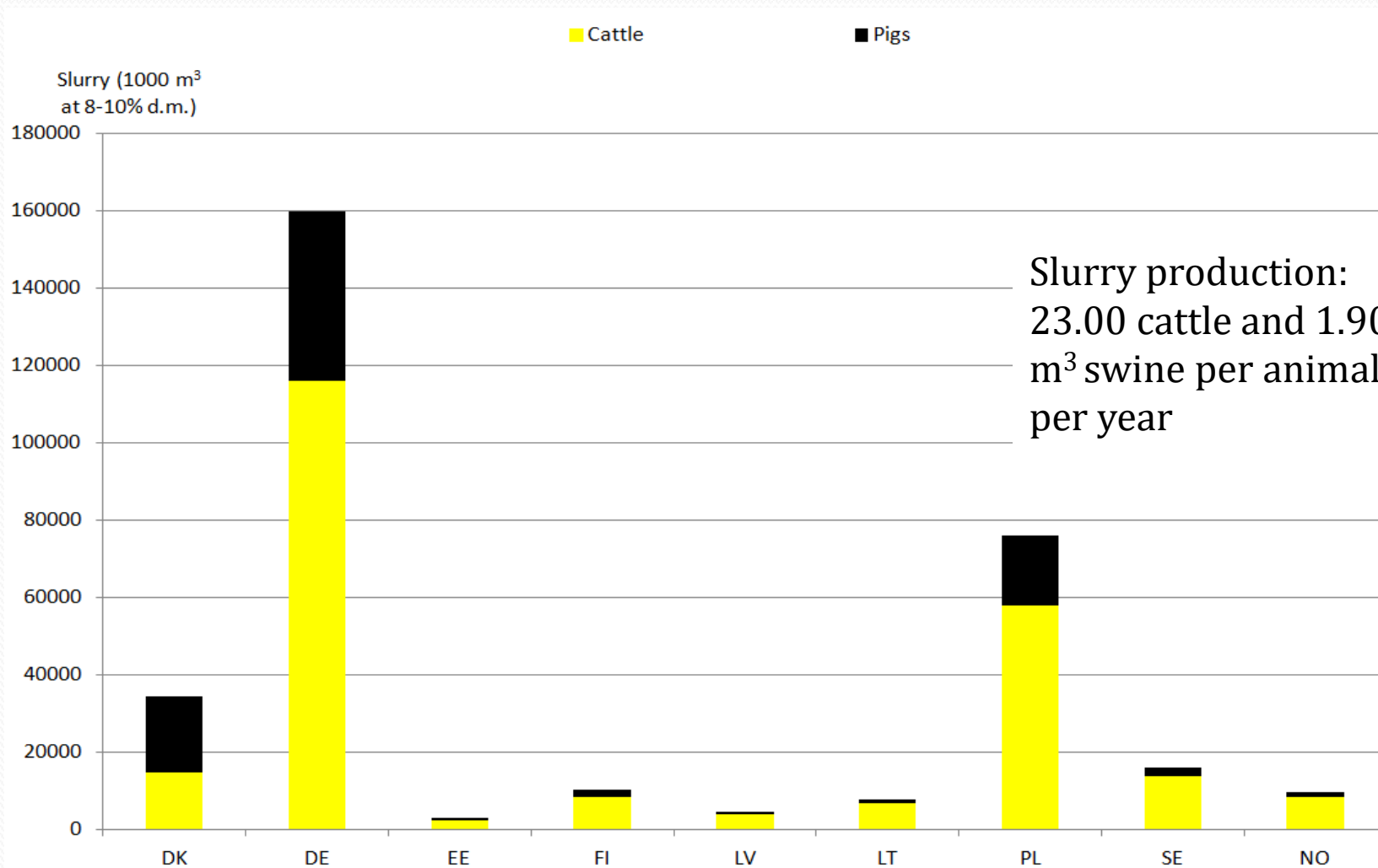


Manure production (Mg) rates per animal annually:

- cattle 14.80
- pigs 1.50
- sheep 1.20
- horses 5.00
- goats 1.00
- chickens 0.035
- turkeys 0.060
- ducks 0.060
- geese/guinea fowls 0.040

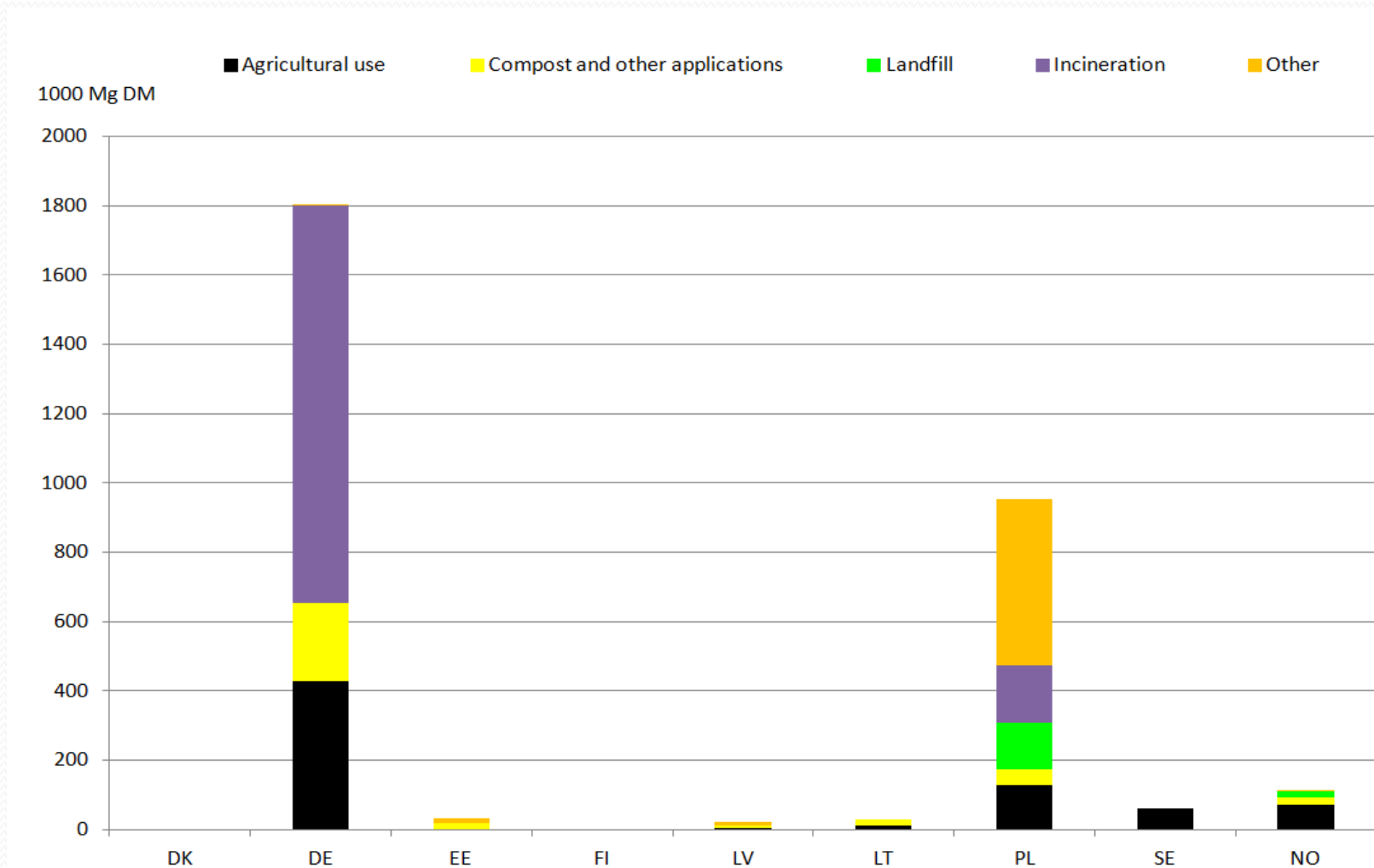
Source: own calculation.

Theoretical cattle and swine slurry potential in the BSR countries in 2017 (1000 m³/year at 8-10% DM)



Source: own calculation.

Sludge disposal from wastewater treatment plants in the BSR countries in 2015

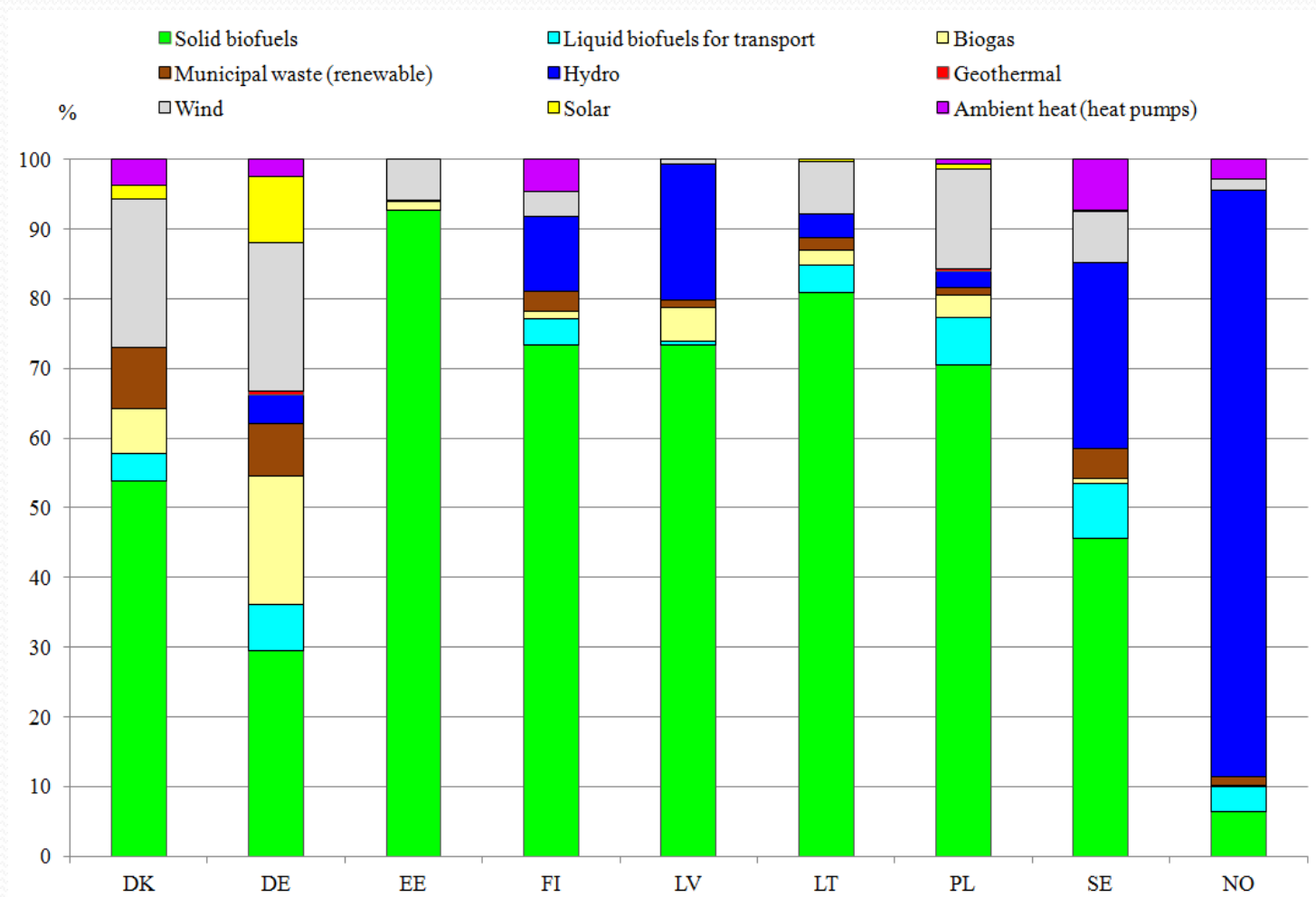


Source: Eurostat, 2019.



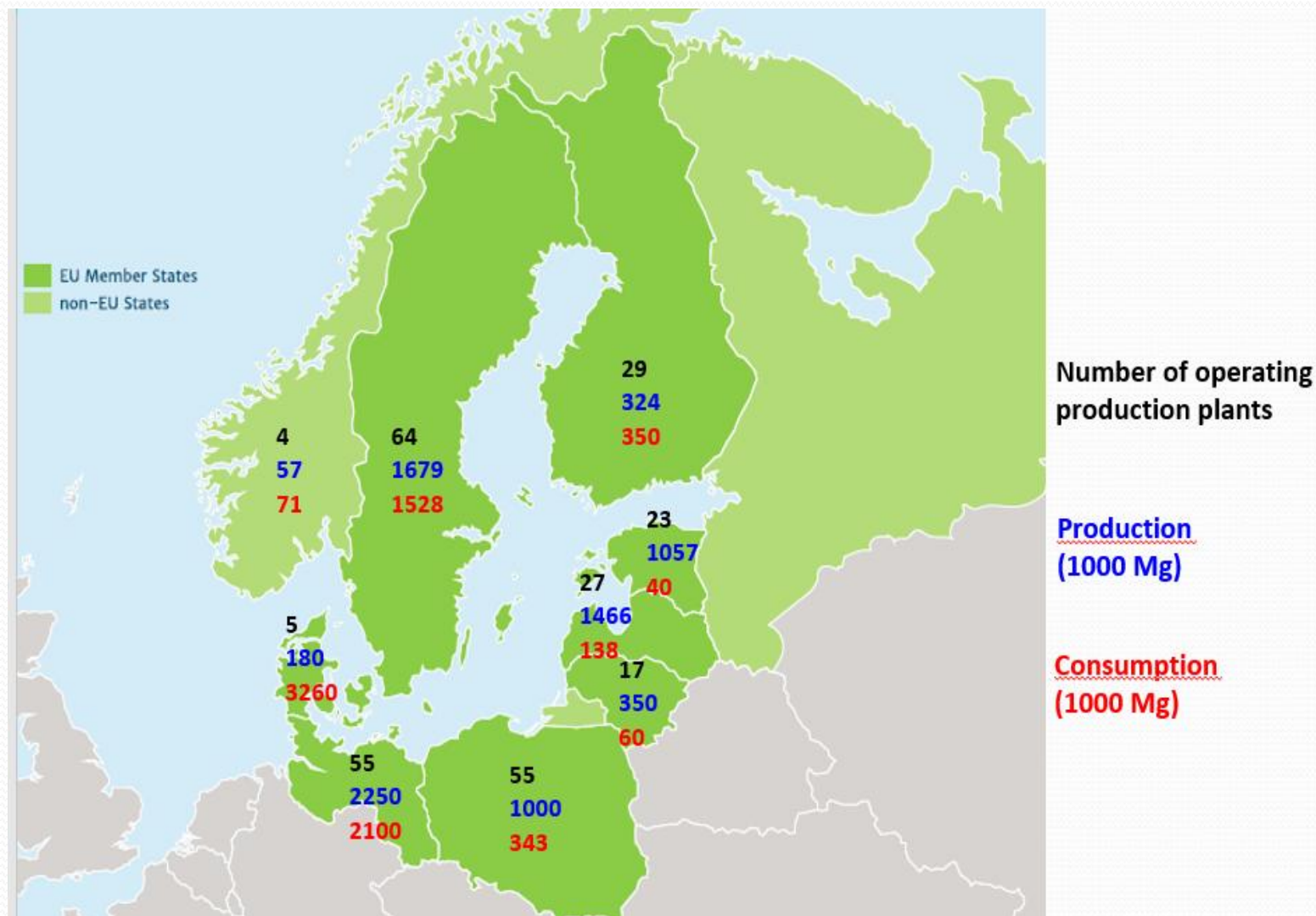
Documented good practice solutions for improved biomass value chains in the BSR countries

Share of different types of renewables in gross inland consumption of total RES in BSR countries in 2017 (%)

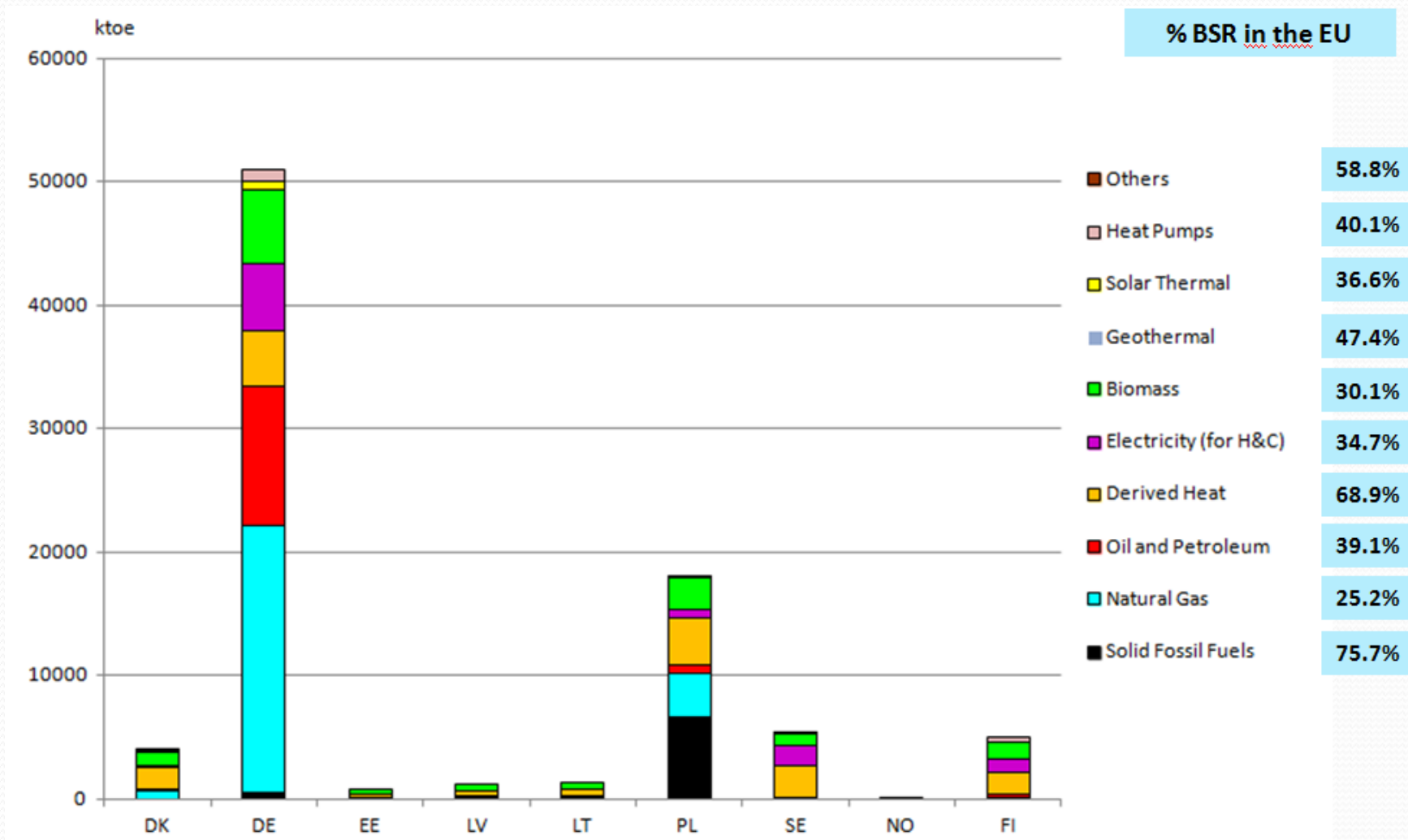


Source: Eurostat, 2019.

Pellets market in BSR countries in 2017

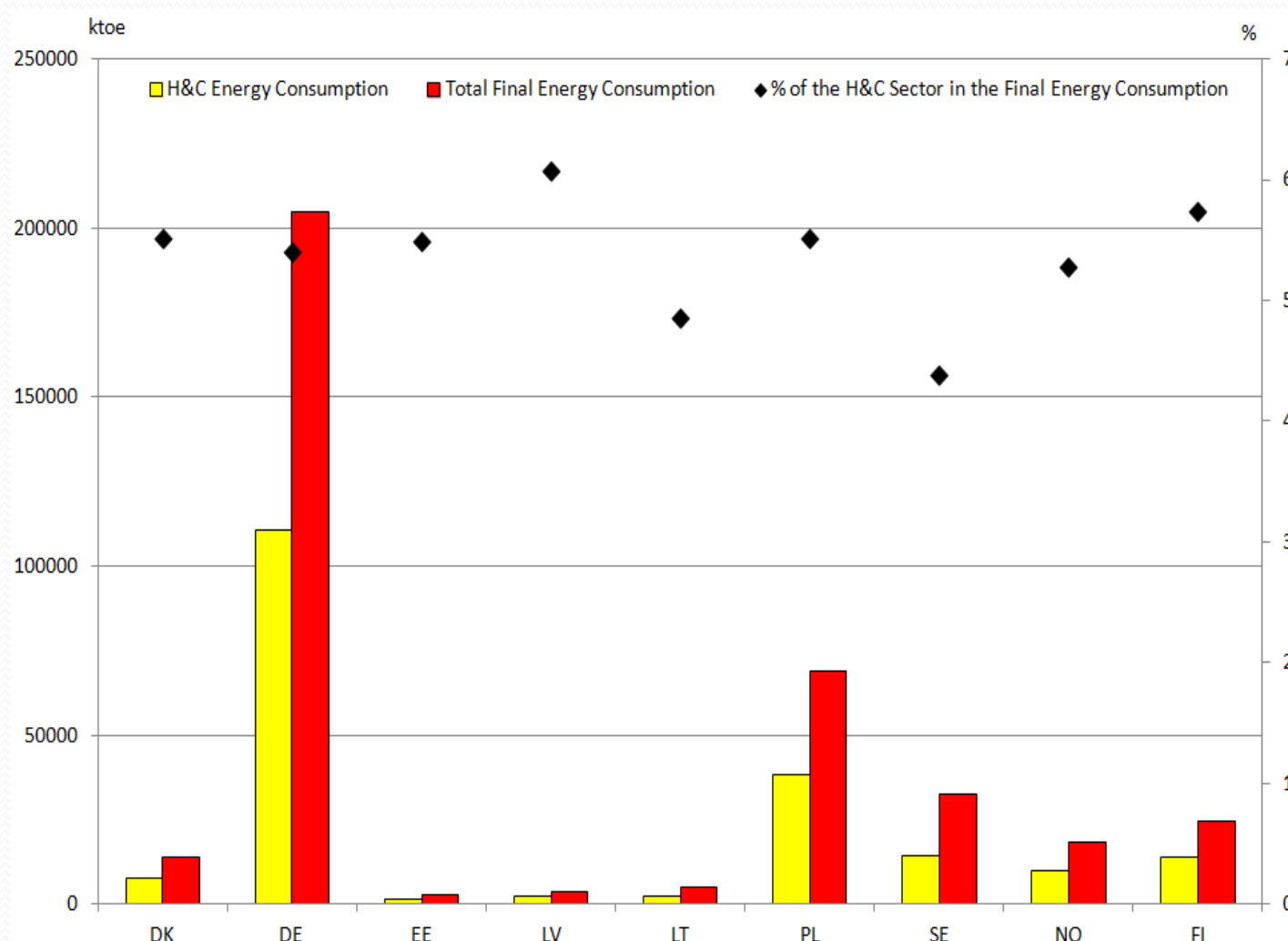


Residential heat production by fuel in the BSR countries in 2017 (ktoe)



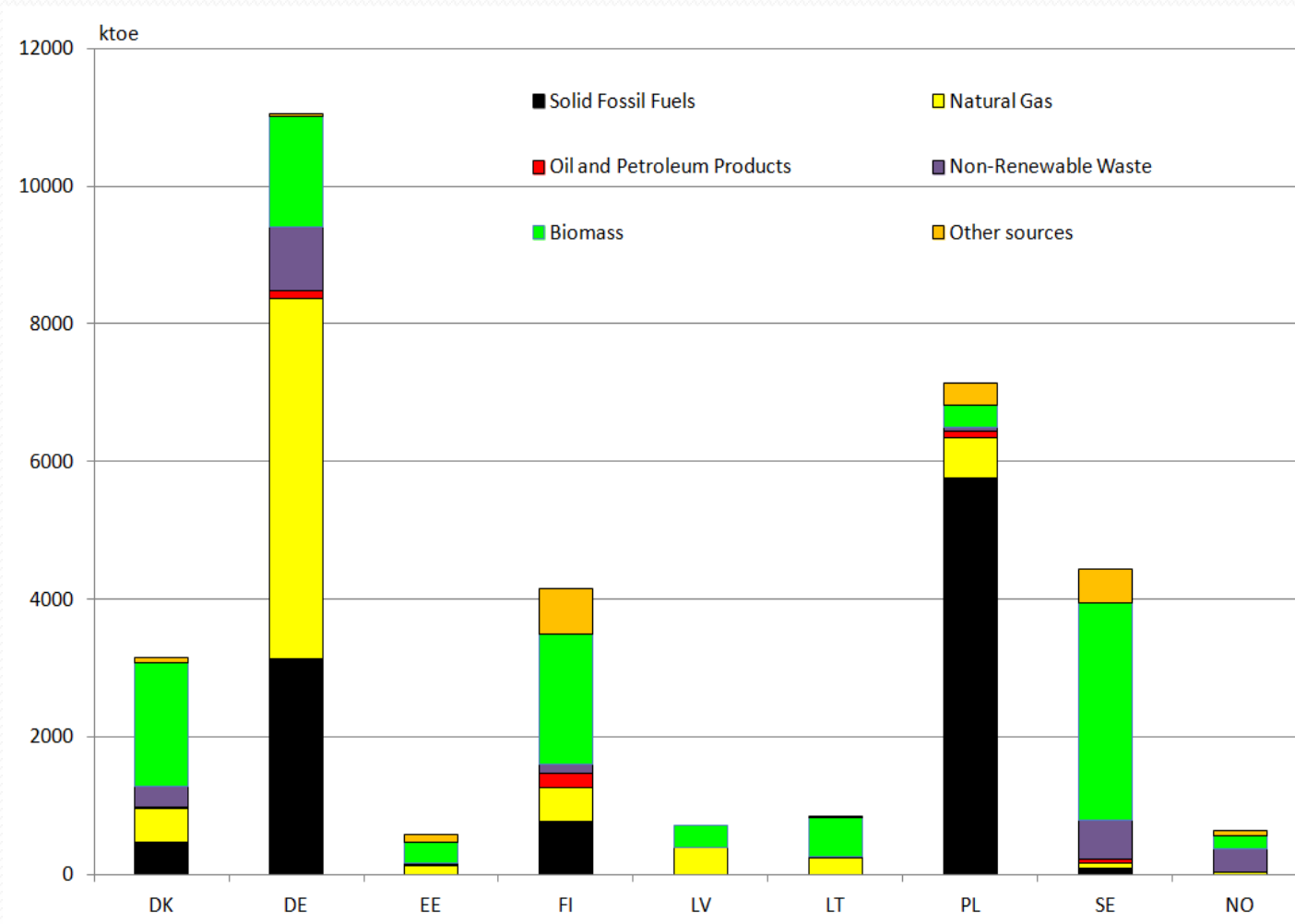
Source: Bioenergy Europe, 2019

Heating and cooling consumption compared with total final energy consumption in the BSR countries in 2017



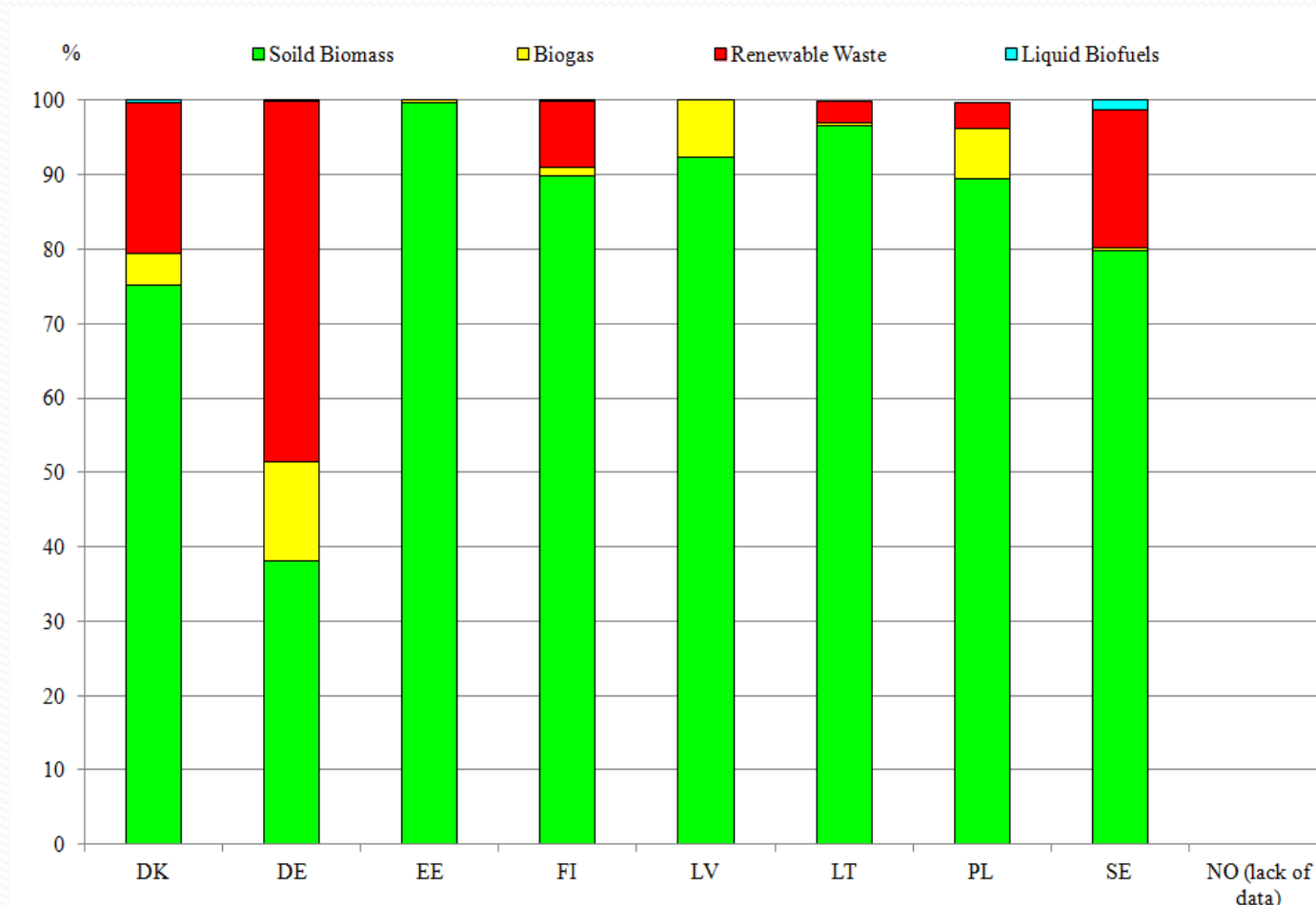
Source: Bioenergy Europe, 2019

Gross production of derived heat by type of fuels in the BSR countries in 2017



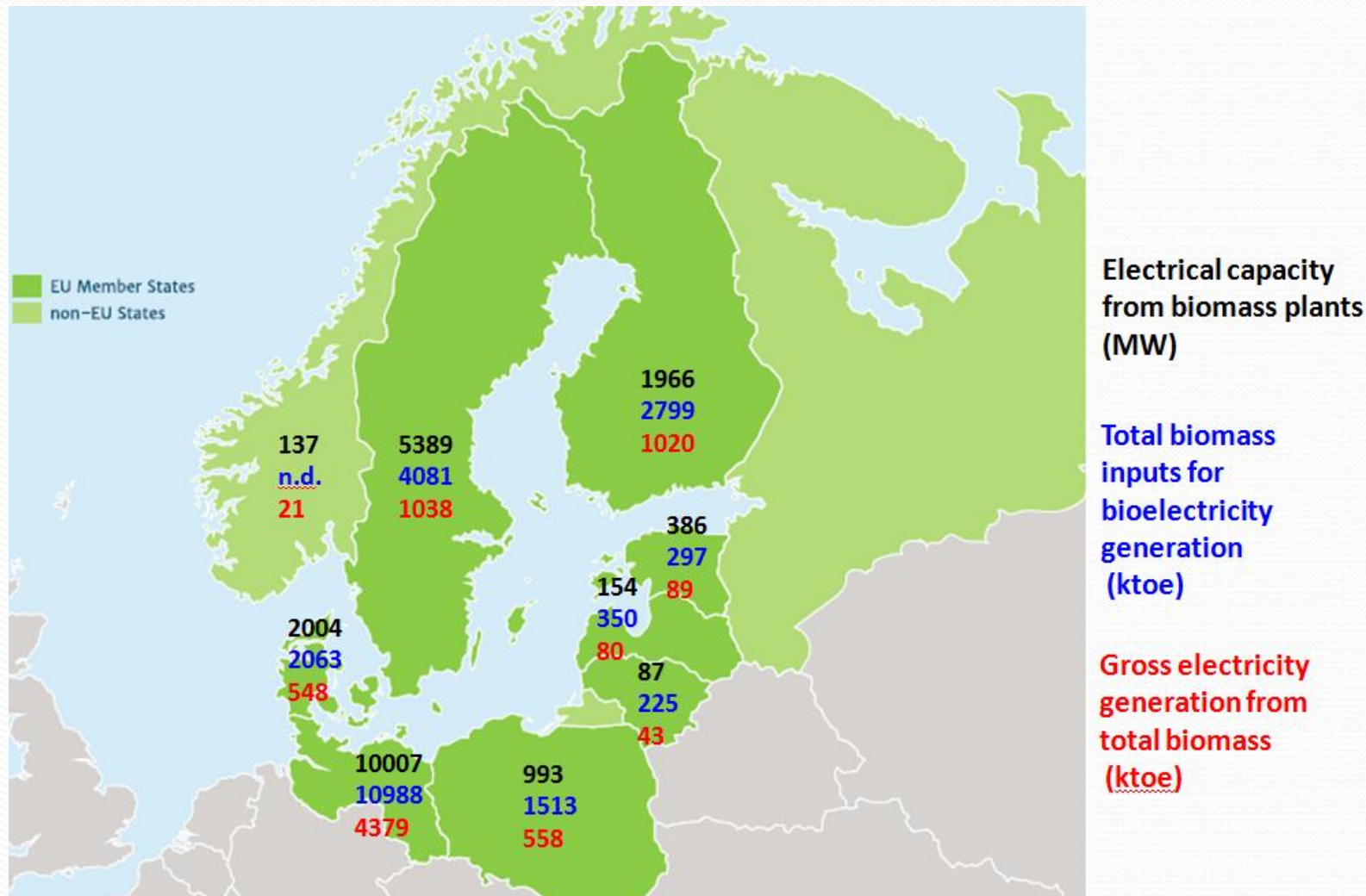
Source: Bioenergy Europe, 2019

Share of renewable sources in gross production of derived bioheat in the BSR countries in 2017 (%)



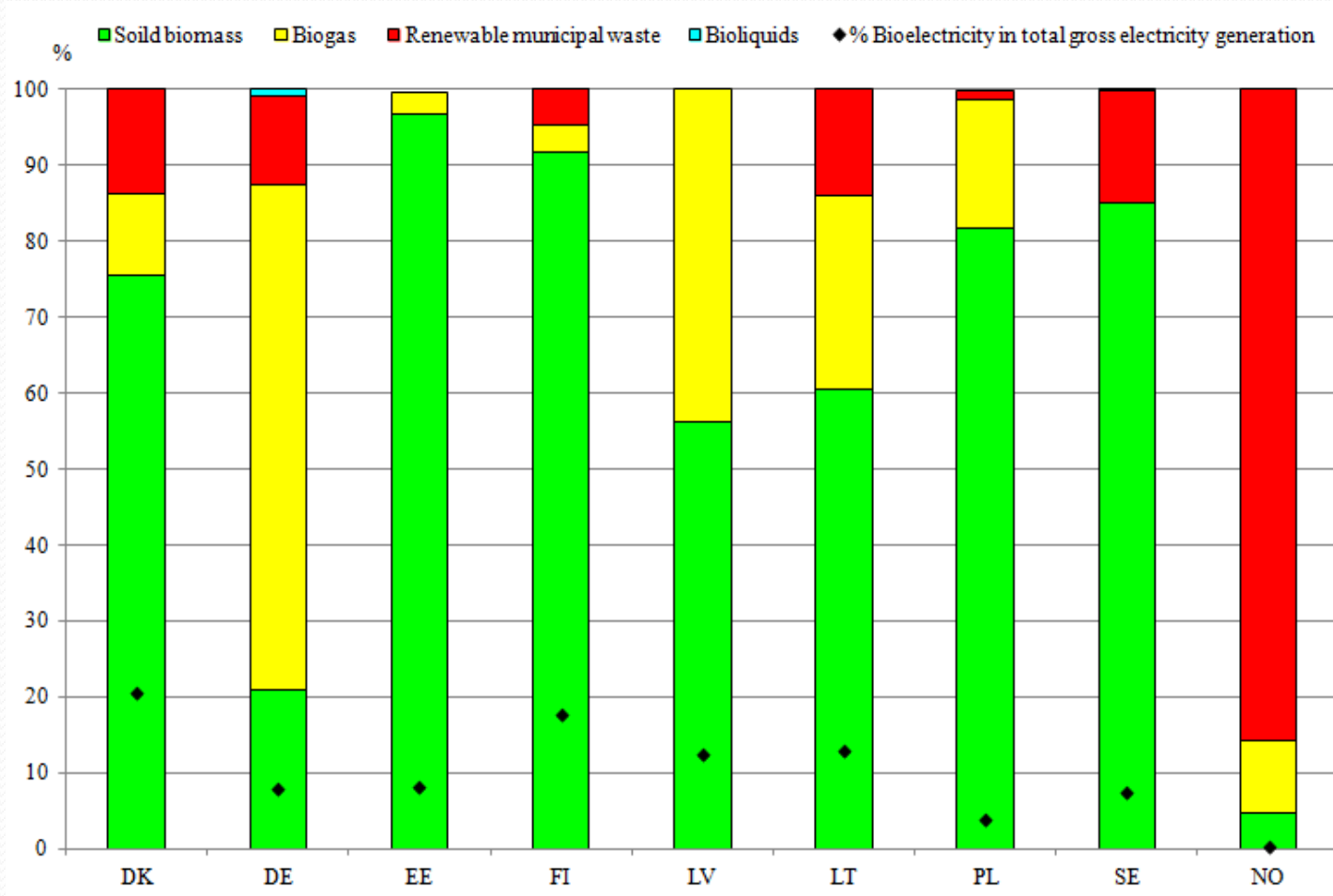
Source: Bioenergy Europe, 2019

Bioelectricity in the BSR countries in 2017



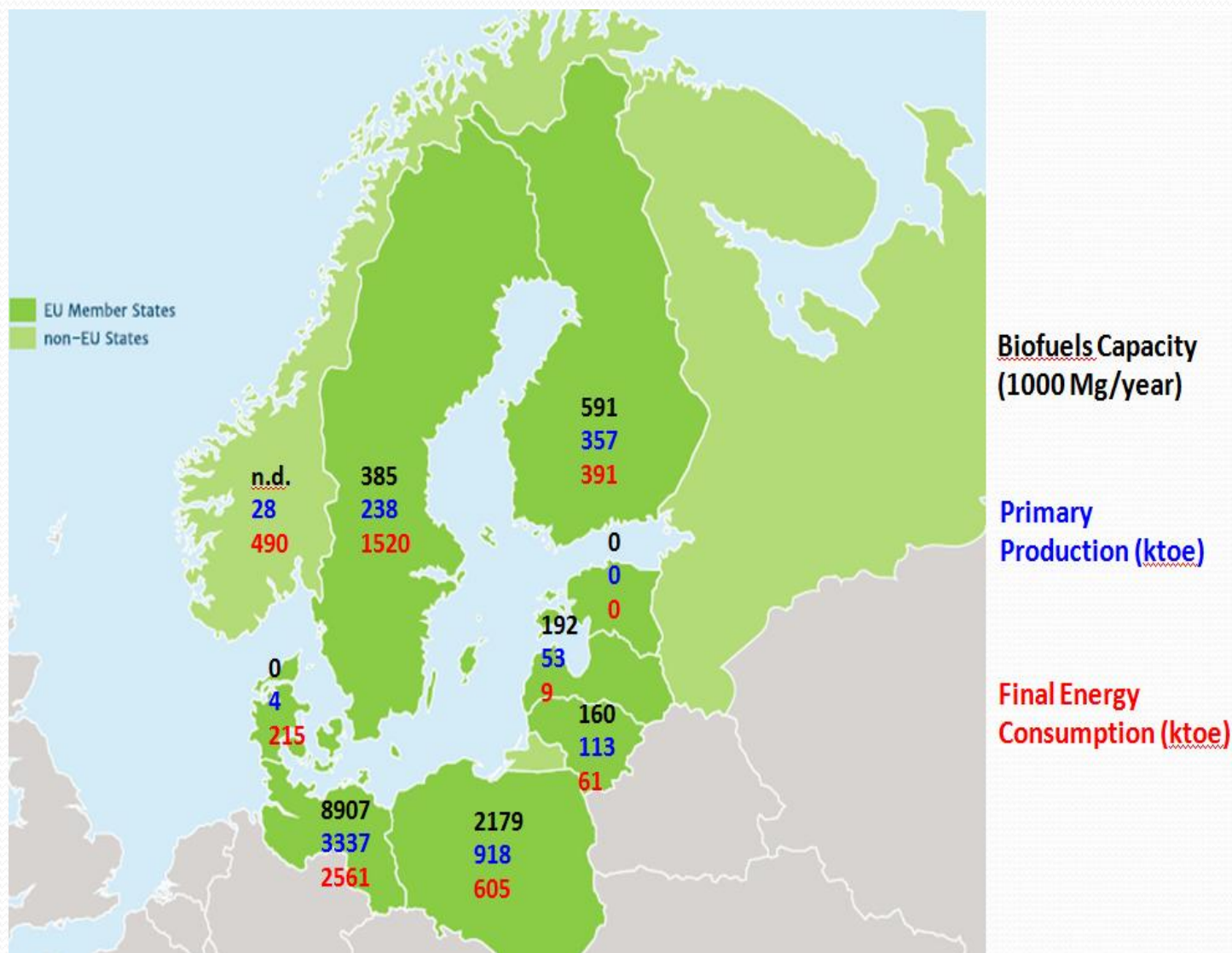
Source: Bioenergy Europe, 2019

Share of different sources in gross electricity generation from biomass and share of bioelectricity in total gross electricity generation in the BSR countries in 2017



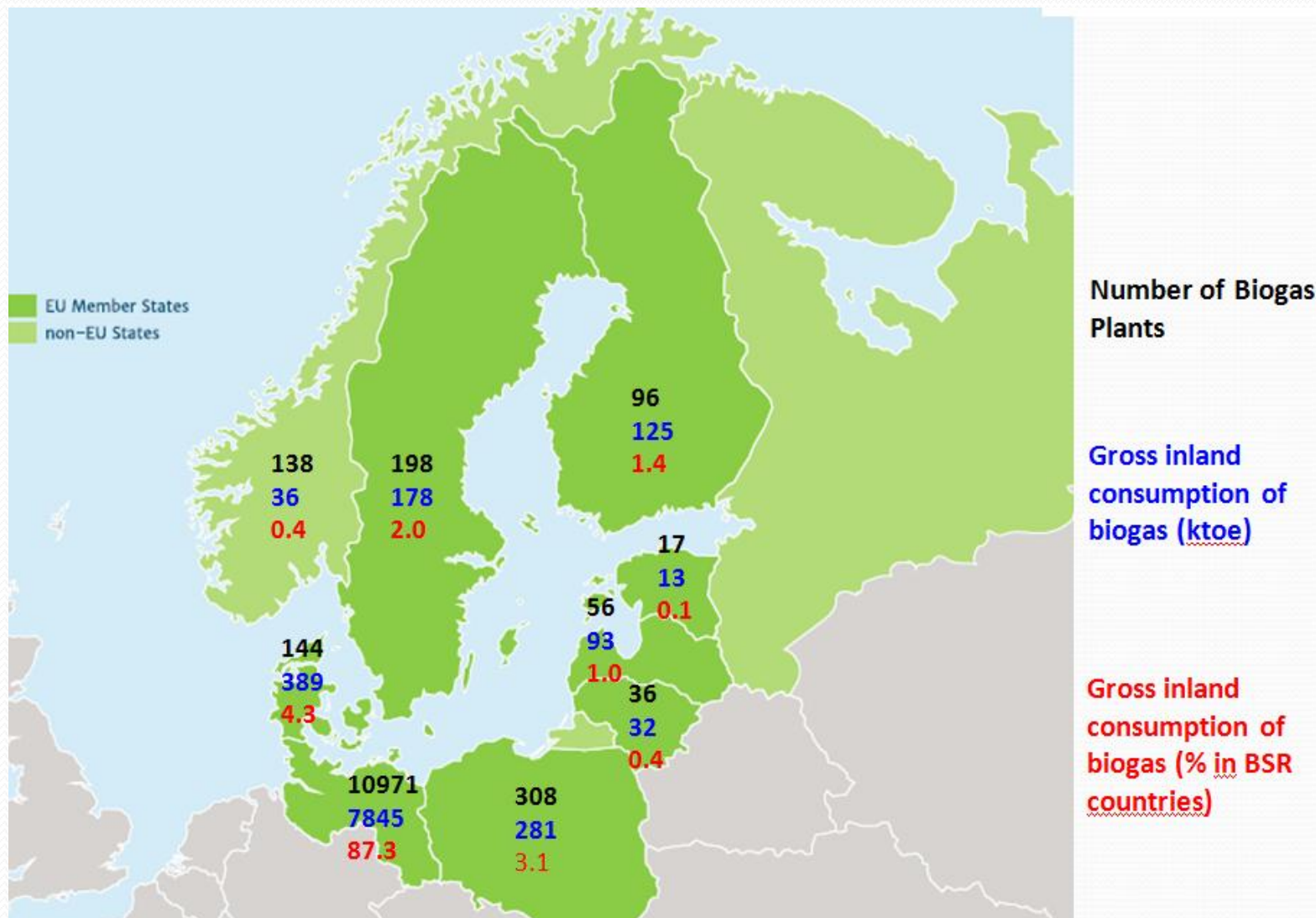
Source: Bioenergy Europe, 2019

Liquid biofuels map of the BSR countries in 2017



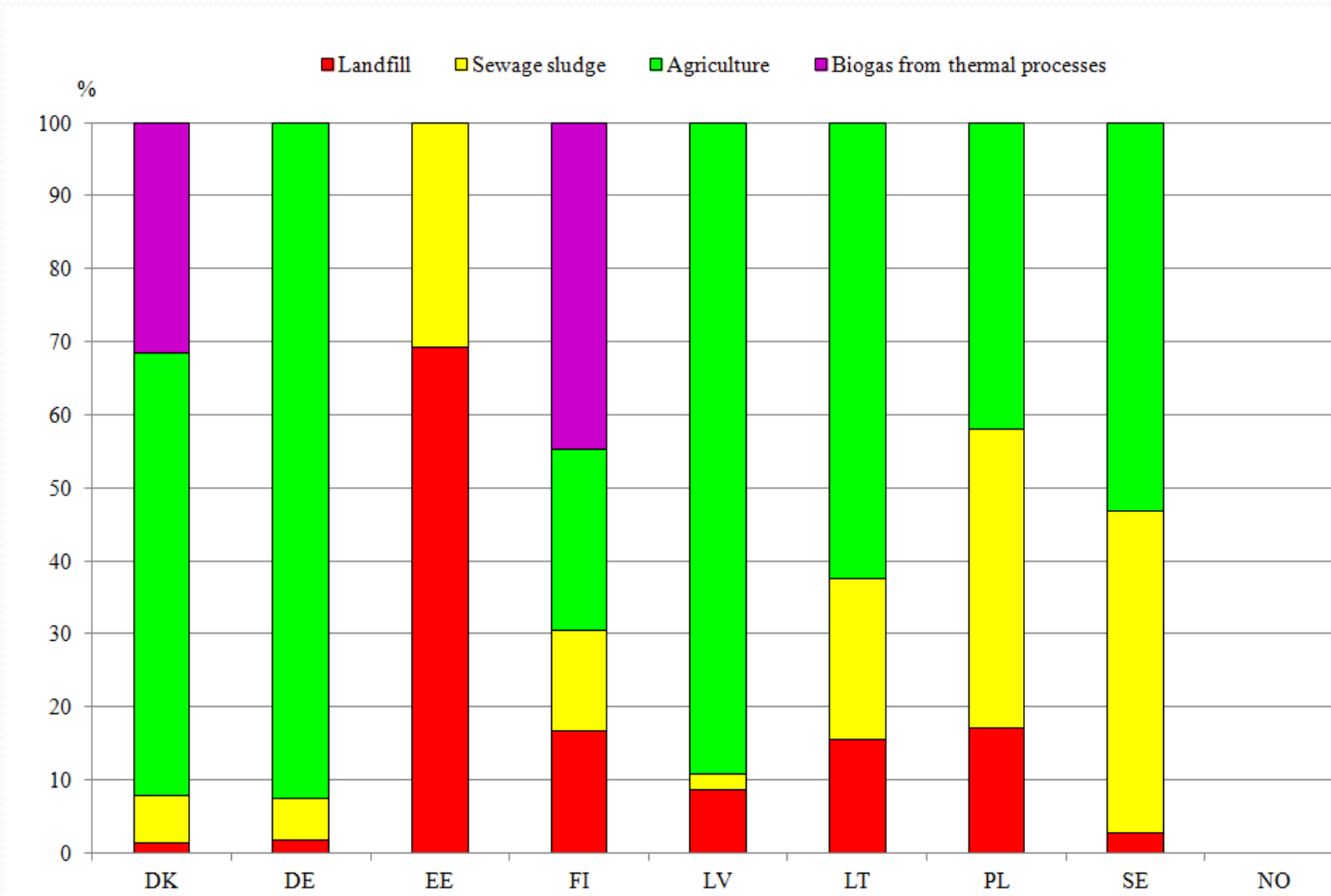
Source: Bioenergy Europe, 2019

Biogas map of the BSR countries in 2017



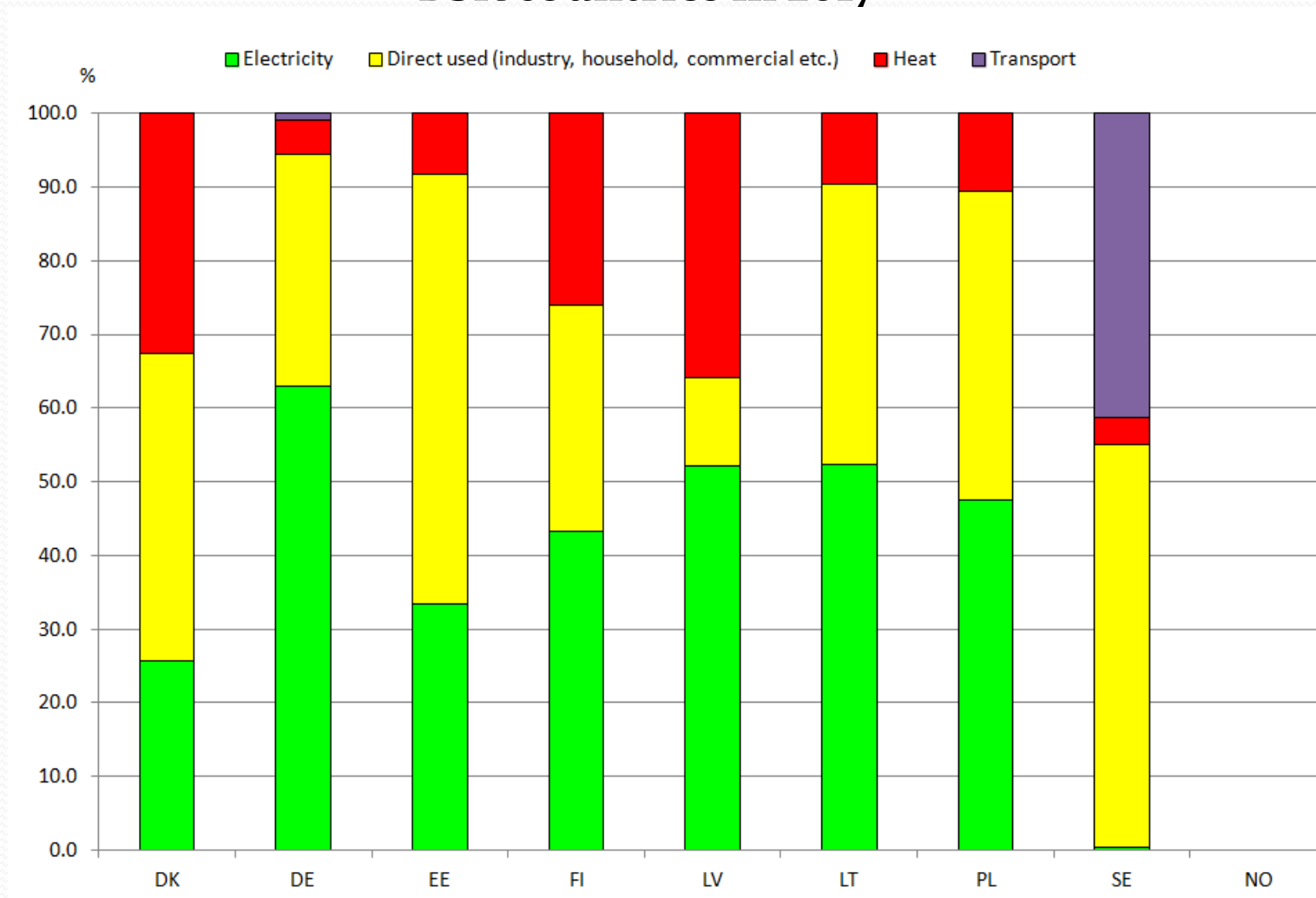
Source: Eurostat, 2019.

Primary energy production of biogas by biogas plant type in the BSR countries in 2017



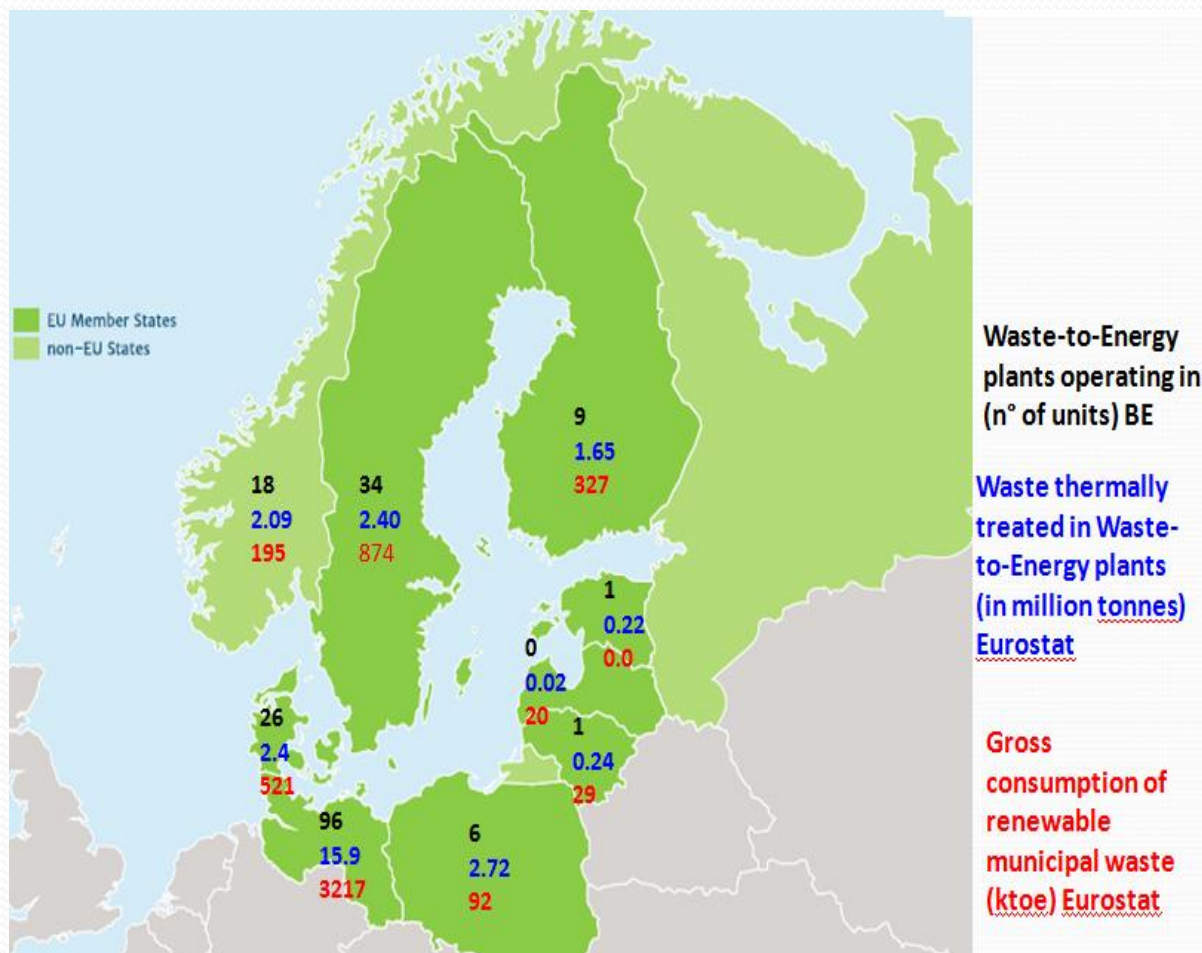
Source: Bioenergy Europe, 2019

Gross final energy consumption from biogas by end-use in the BSR countries in 2017



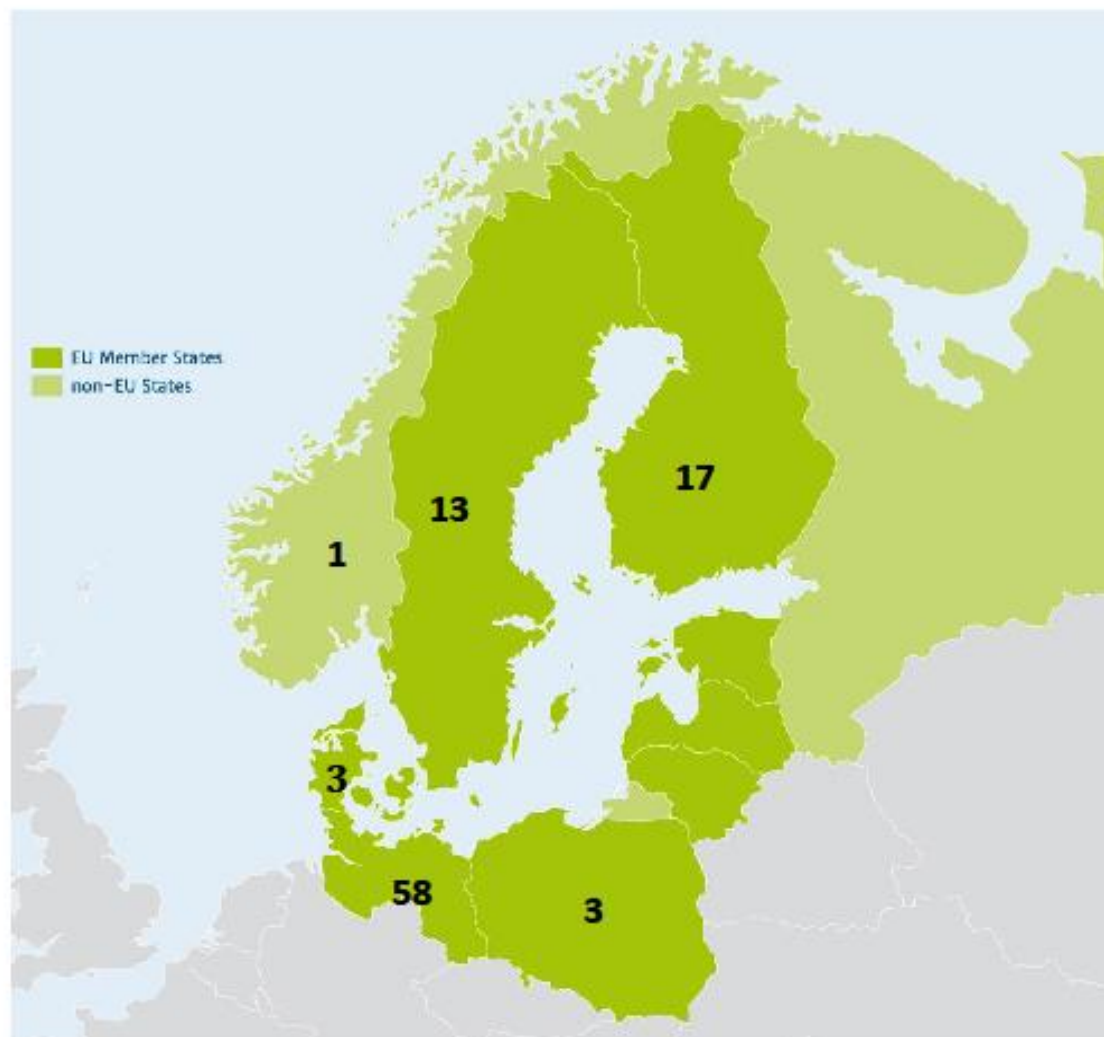
Source: Bioenergy Europe, 2019

Incineration plants and renewable municipal waste for energy recovery and gross energy consumption of renewable municipal waste in the BSR countries in 2017



Source: Eurostat, 2019

Biorefineries in the BSR in 2017



Number of
biorefineries

CONCLUSIONS

- BSR countries were characterised by a high share of woodlands and agricultural land. They produce large amount of wood and agricultural biomass, particularly Germany and Poland.
- BSR countries had high share of pellets production among all the EU. The technical potential of straw in the BSR countries amounted to 34% of the whole EU potential.
- The area of dedicated perennial crops amounted to 55% of the total area of these crops in the EU.
- The potential of manure and slurry amounted to 25% and 30% of the potential of the whole European Union, respectively.
- The above conditions allowed to use biomass for various purposes and in many bioenergy technologies, i.e. direct combustion, first and second generation biofuels or biogas production. There is still space for improving biomass use, especially concerning heat and electricity generation in BSR countries.
- High level of development and utilisation of bioenergy in part of BSR countries allow to share best practices and technologies in order to increase the contribution of bioenergy in all BSR countries.



THANK YOU FOR ATTENTION

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