Comparative assessment of framework conditions for biogas production in Norway and Denmark

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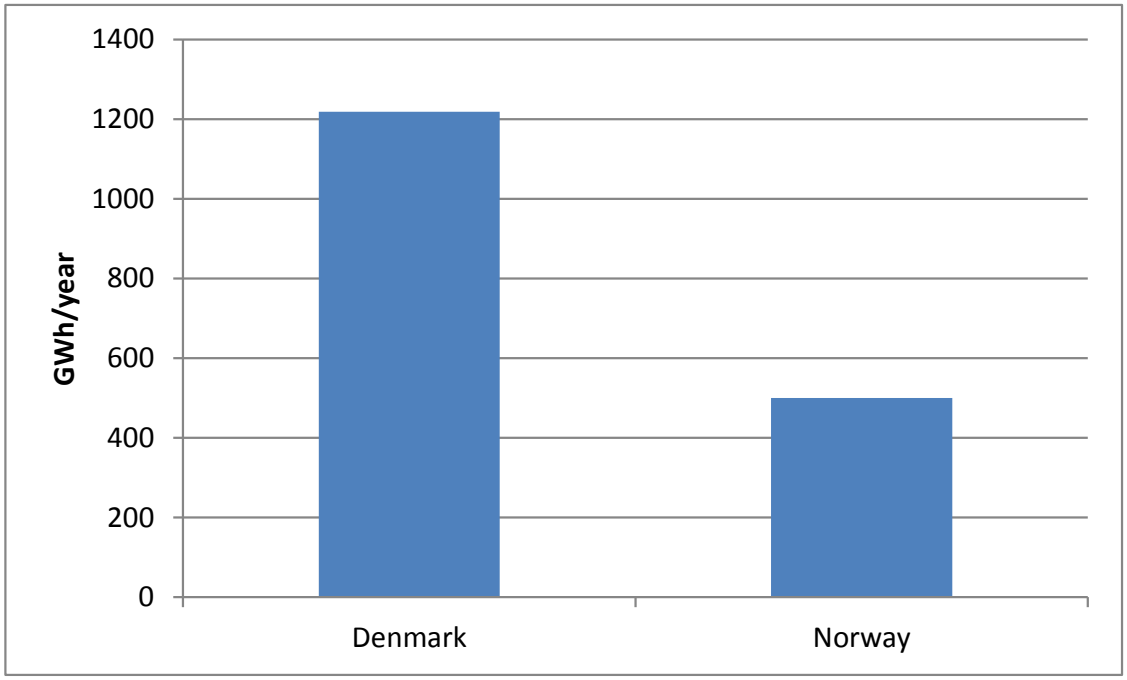
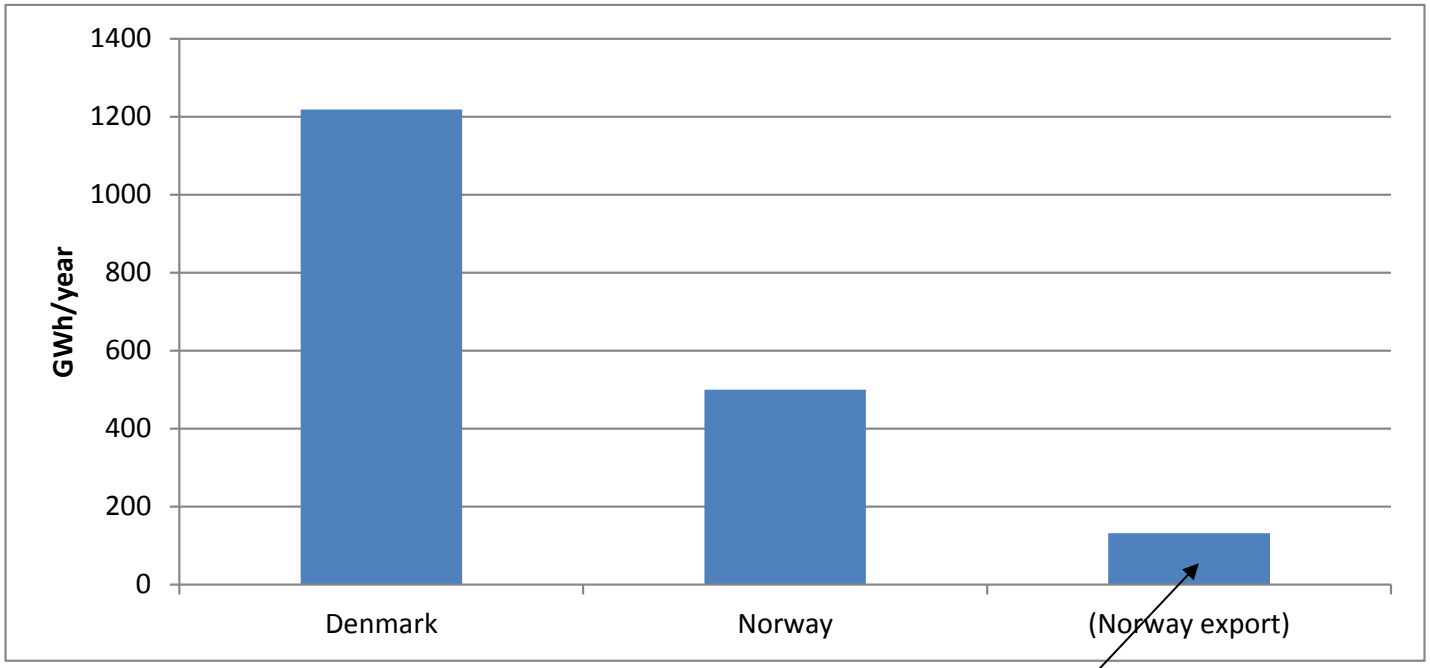
Biogas production in Norway and Denmark



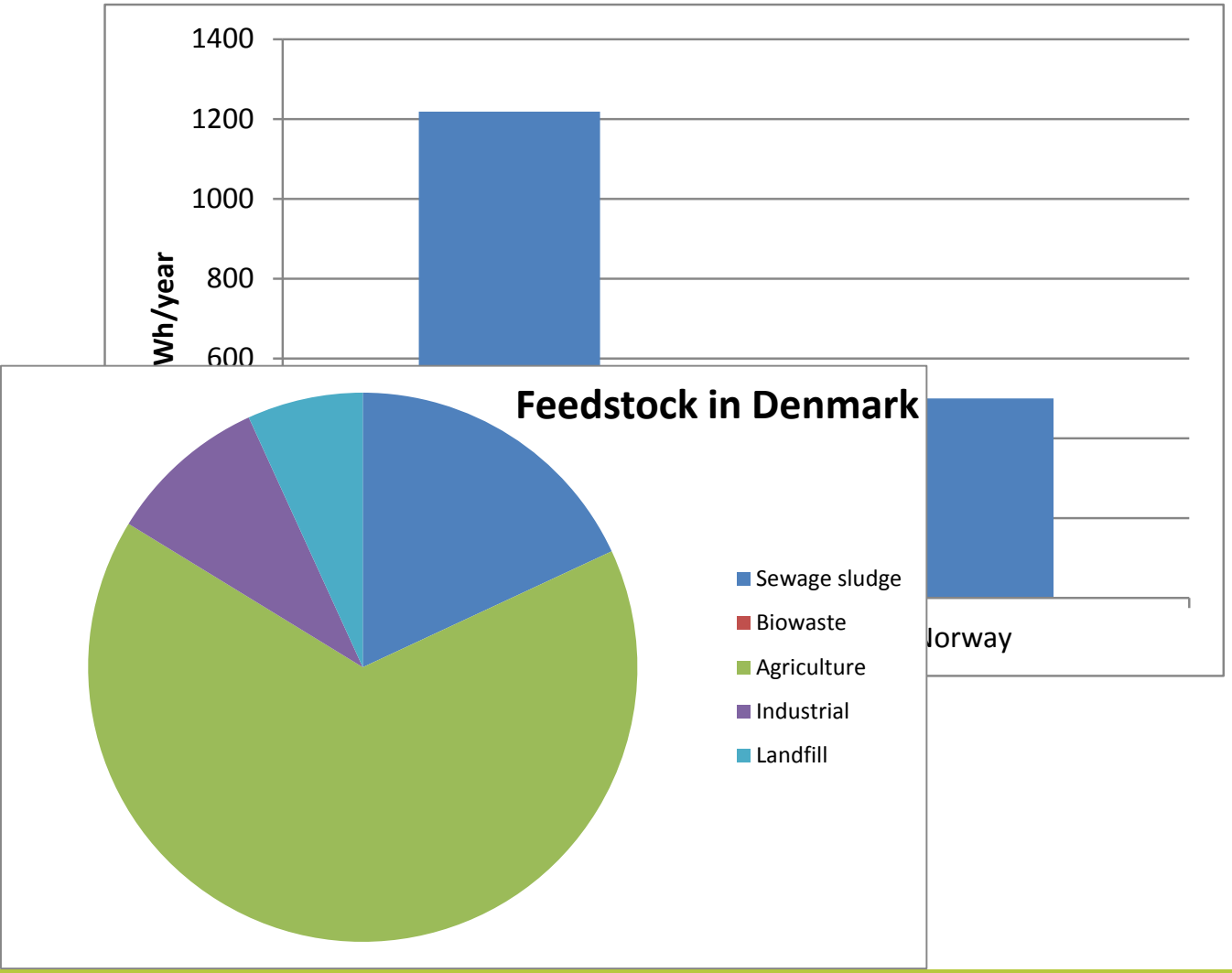
Ref: IEA task 37 2013

Biogas production in Norway and Denmark

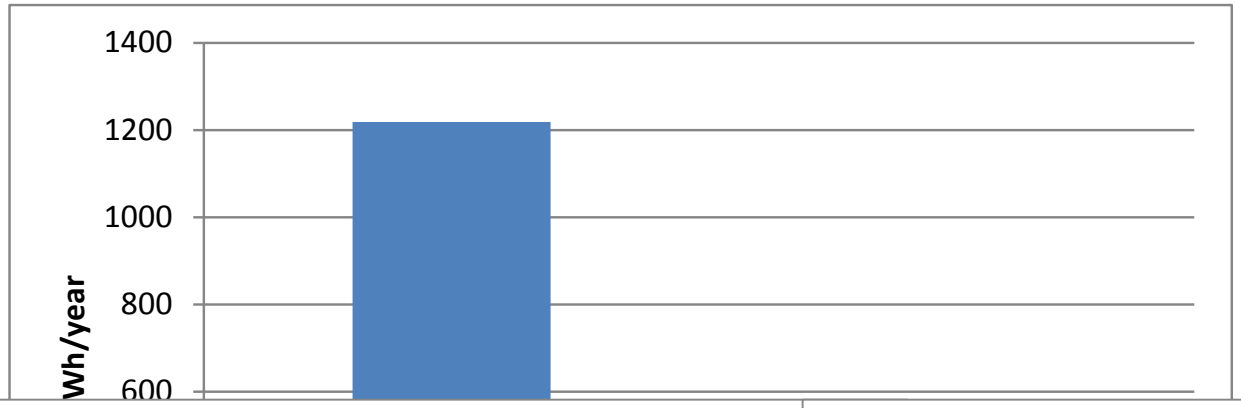


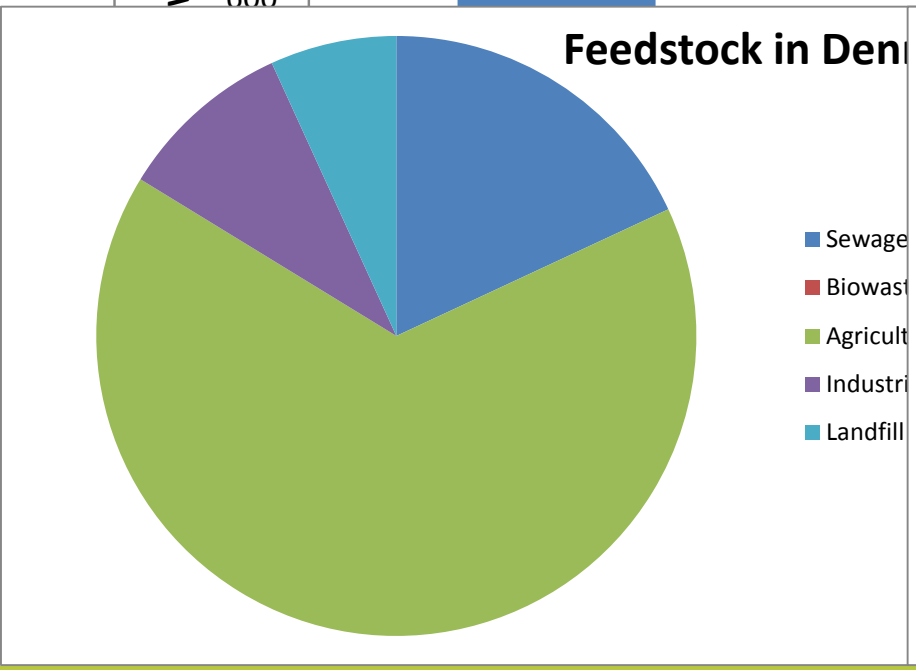
Export of organic waste

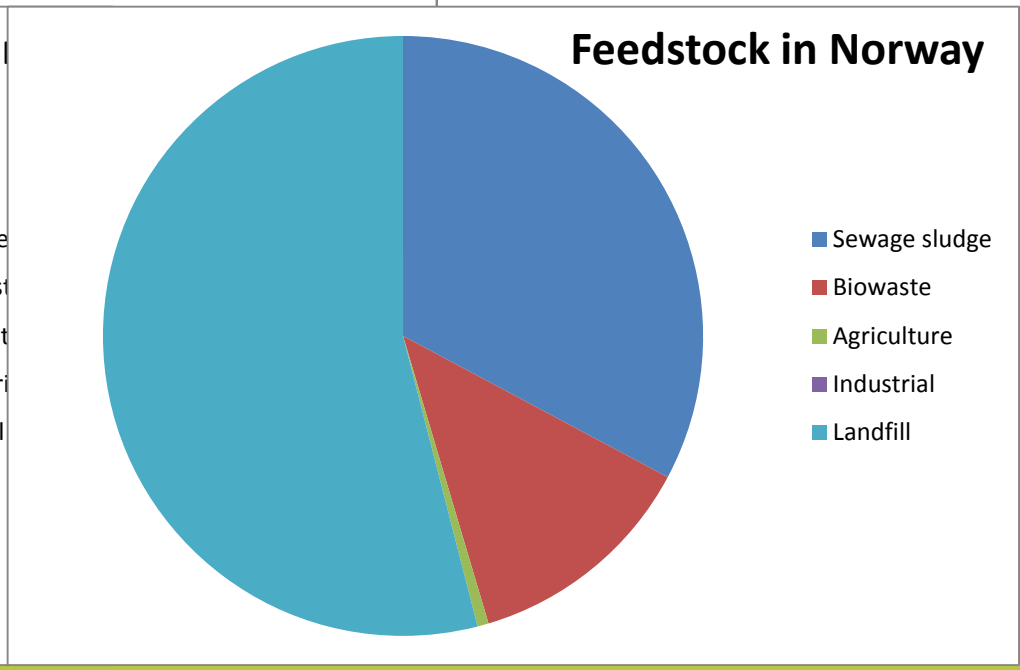
Biogas production in Norway and Denmark



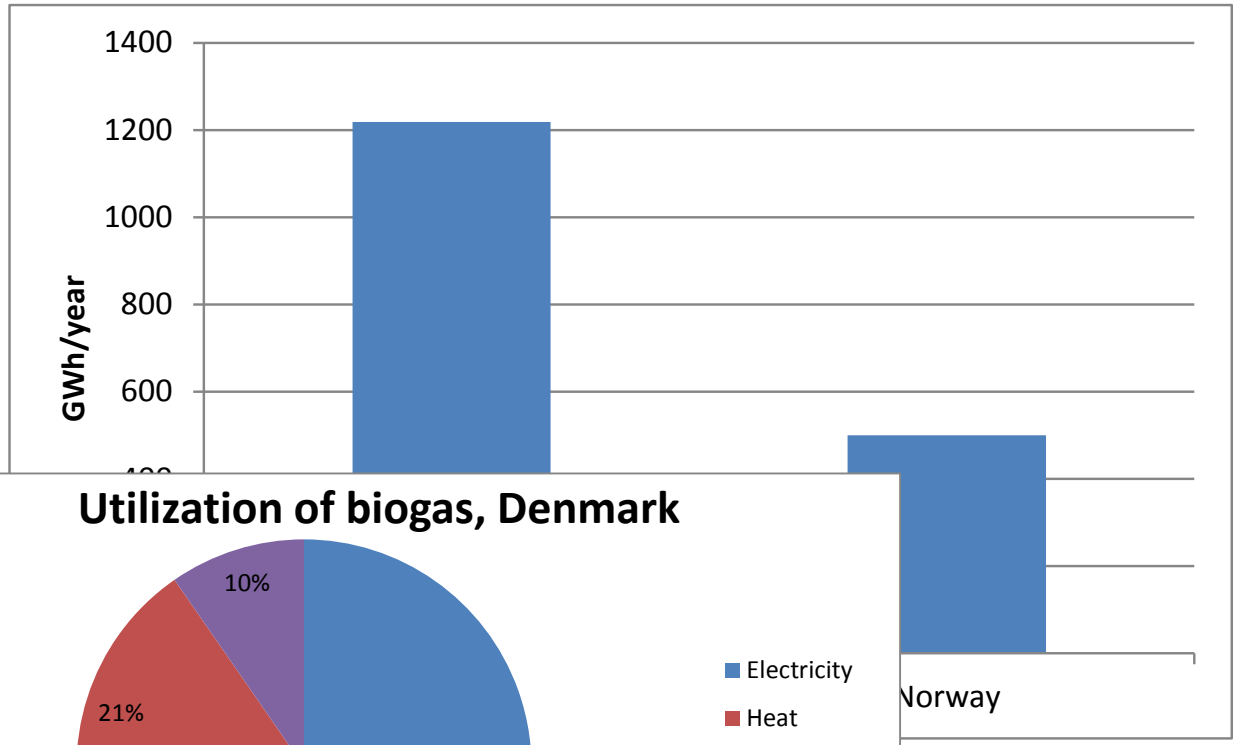
Biogas production in Norway and Denmark

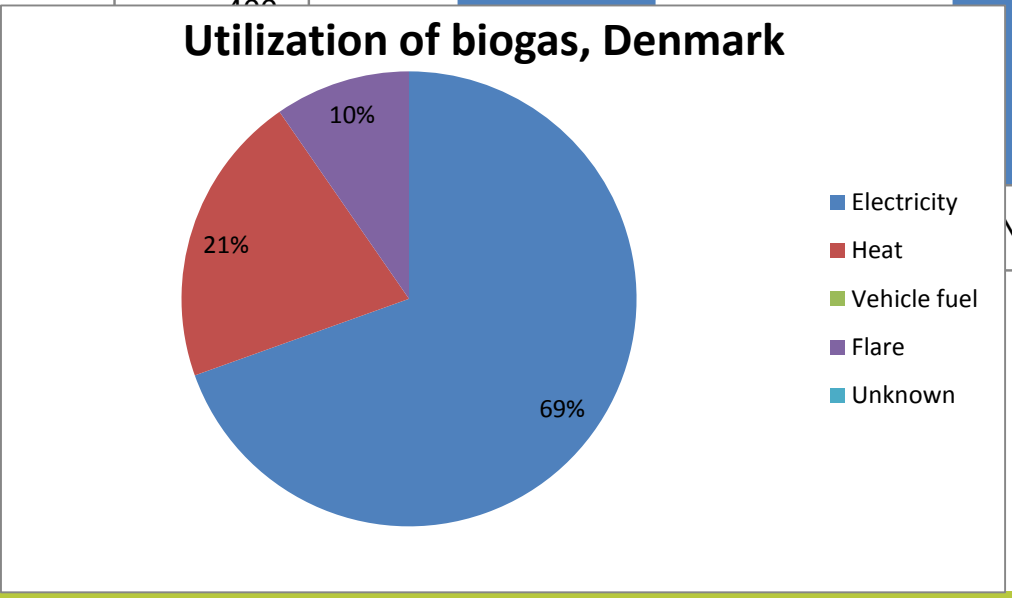






Utilization of biogas





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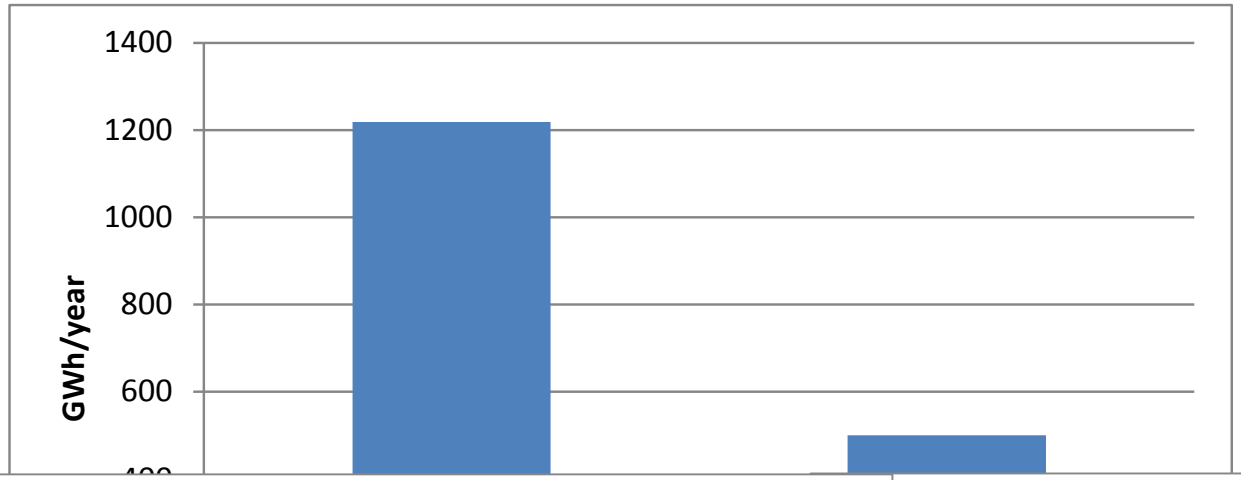
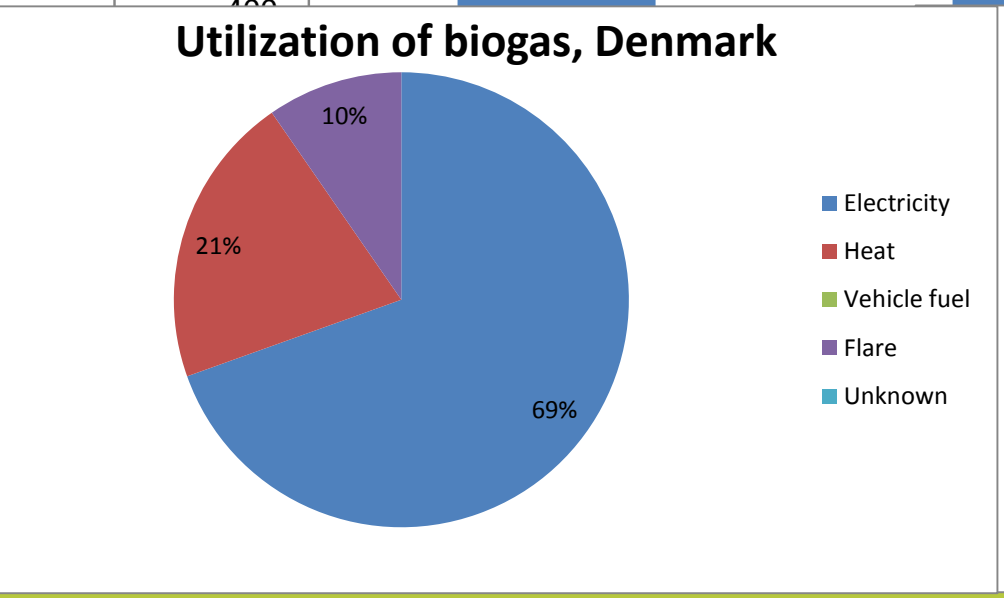
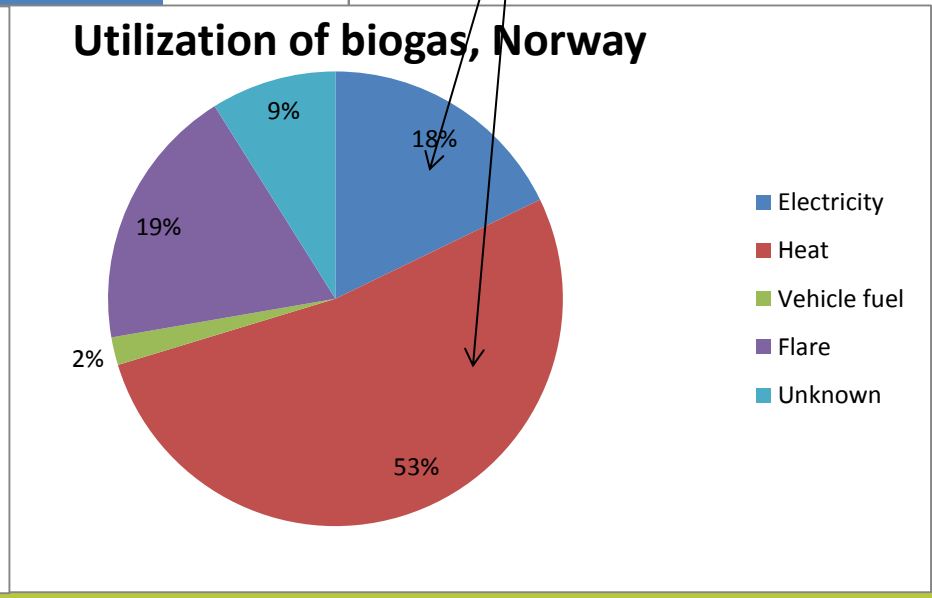


Approximately 60 % of the biogas is used at the production plants





Utilization of digestate

No statistics found

General impression:

- Denmark: Fertilizer

(restrictions on sewage sludge)

- Norway: Normally dewatered and composted

  New plants: Fertilizer

Ref:Eurostat

Framework conditions

- Demography (logistics) and population density

Norway: 13 inhabitants/km^2

Denmark: 128 inhabitants/km^2

- Farm sizes

Average livestock units per farm

Norway: Small farms: 23 Large farms: 61

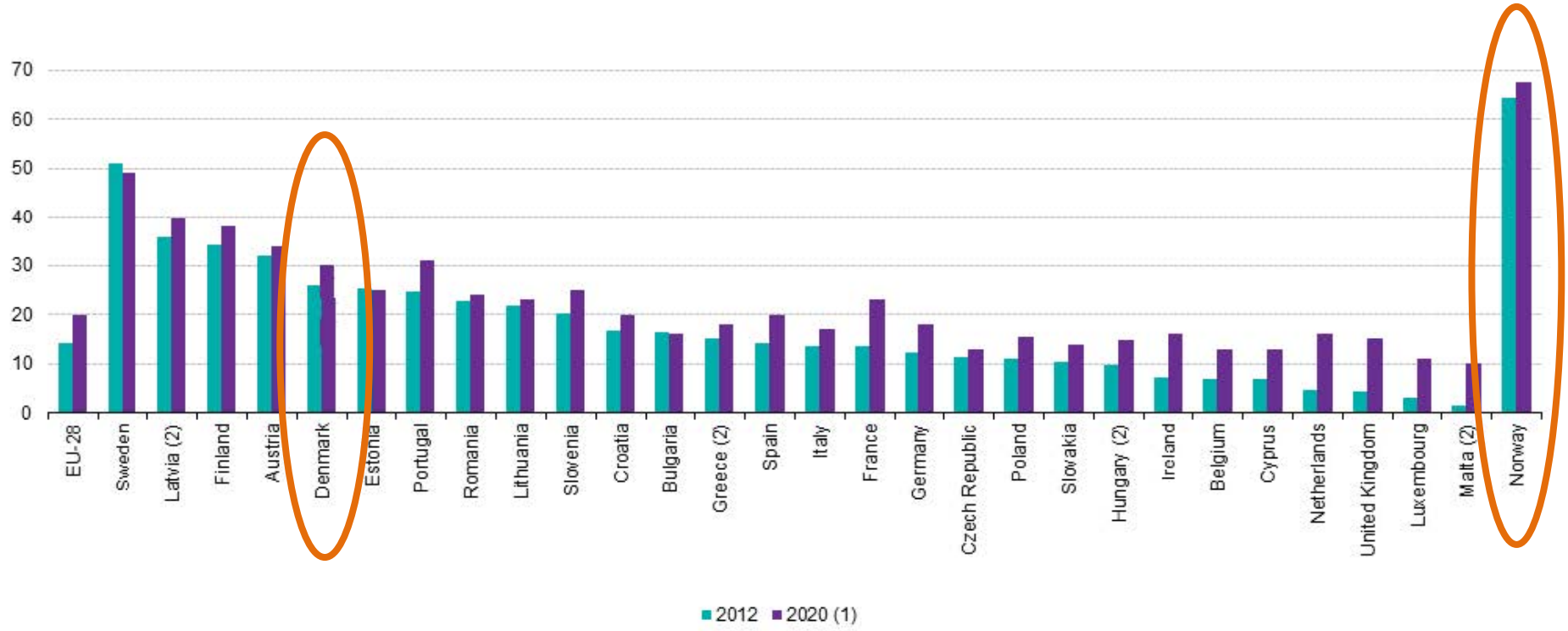
Denmark: Small farms: 86 Large farms:681

- Organic waste

Norway: about 2/3 of inhabitants have source separation of organic waste

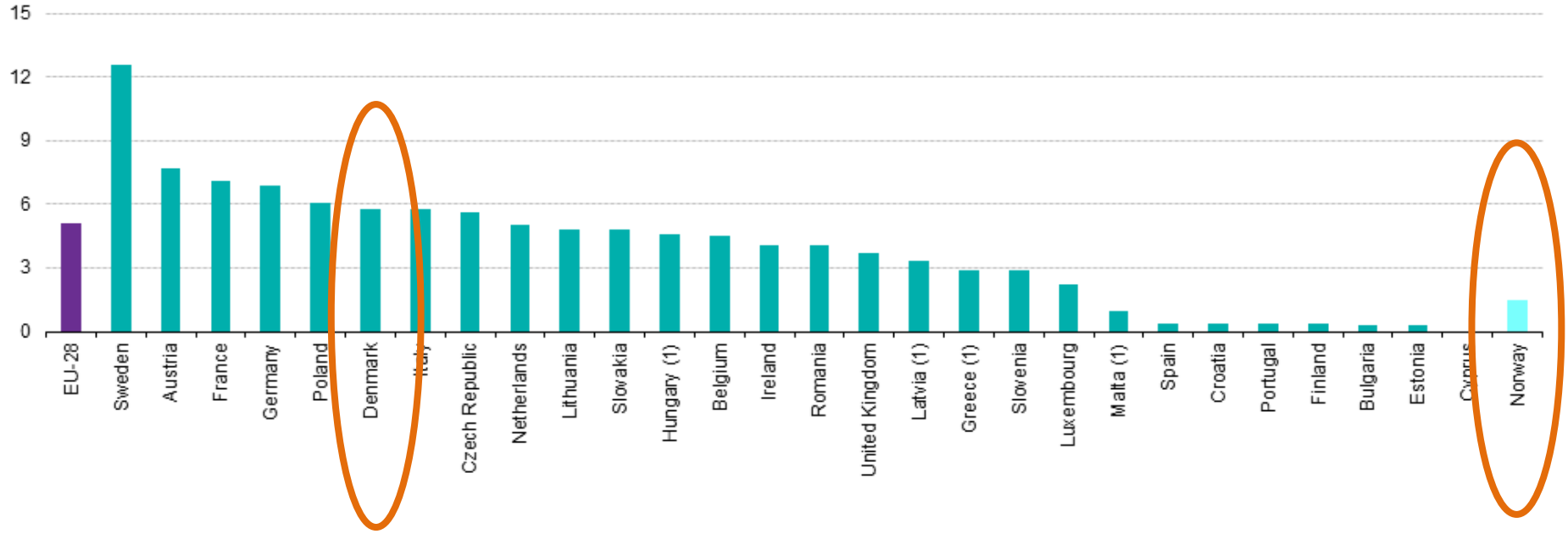
Denmark: ?

Share of renewables in gross final energy consumption, 2012 and 2020 (%)



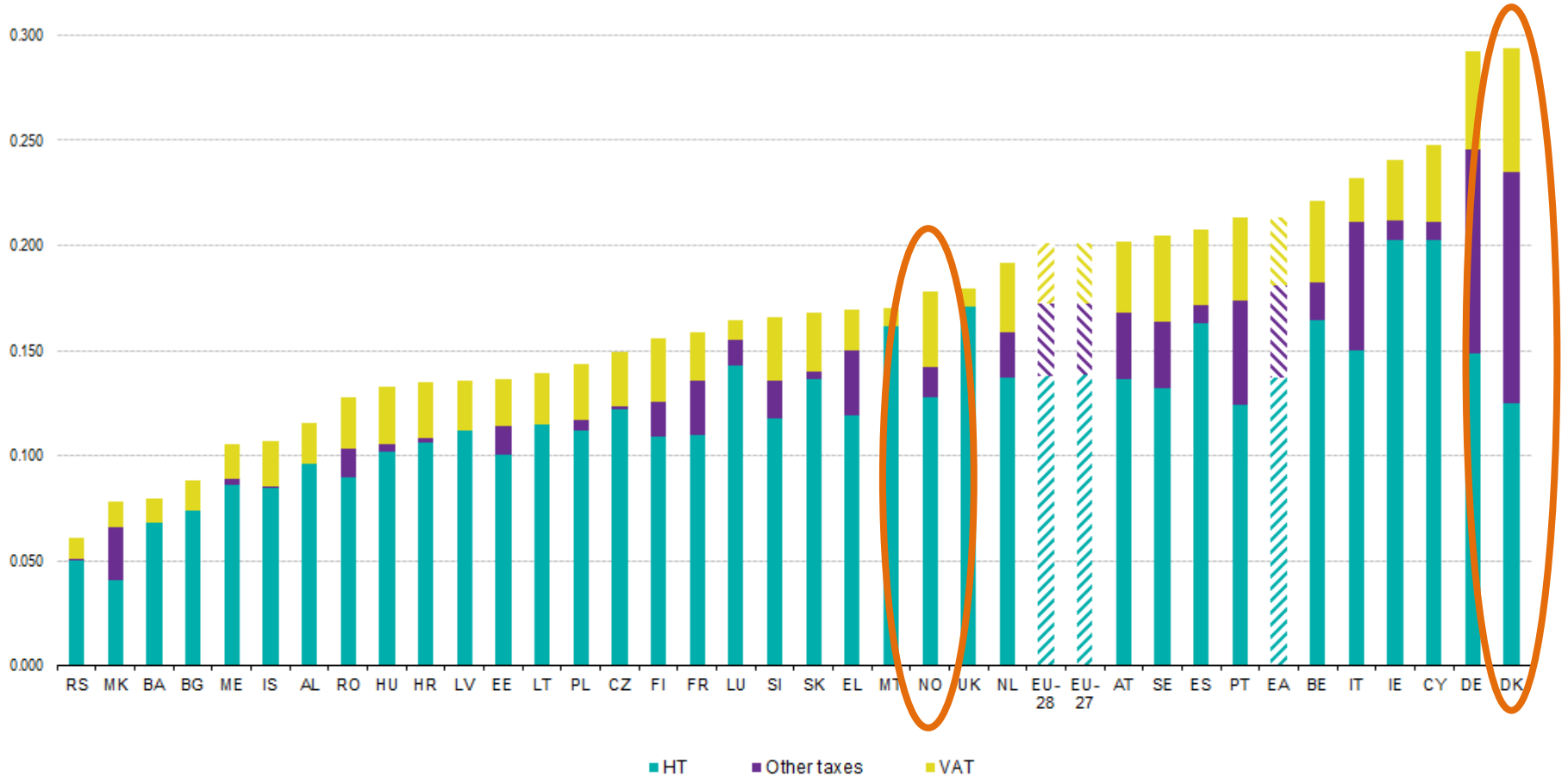
(1) Legally binding targets for 2020.
(2) 2012: estimate.
Source: Eurostat (online data code: t2020_31)

Share of renewable fuels for transport



(1) Estimate.
Source: Eurostat (online data code: tsdcc340)

Electricity prices for households consumers 2013



Ref:Eurostat

Transport fuel prices

Financing the biogas support in DK

- Support to biogas for CHP is provided as support for the electricity output, which is financed via the PSO payments of all electricity consumers - *main driver*
- Support to upgraded biogas will be financed via PSO payments of all natural gas consumers - *main driver*
- Investment support for manure based biogas plants is financed by the government budget (only temporary *main driver*)

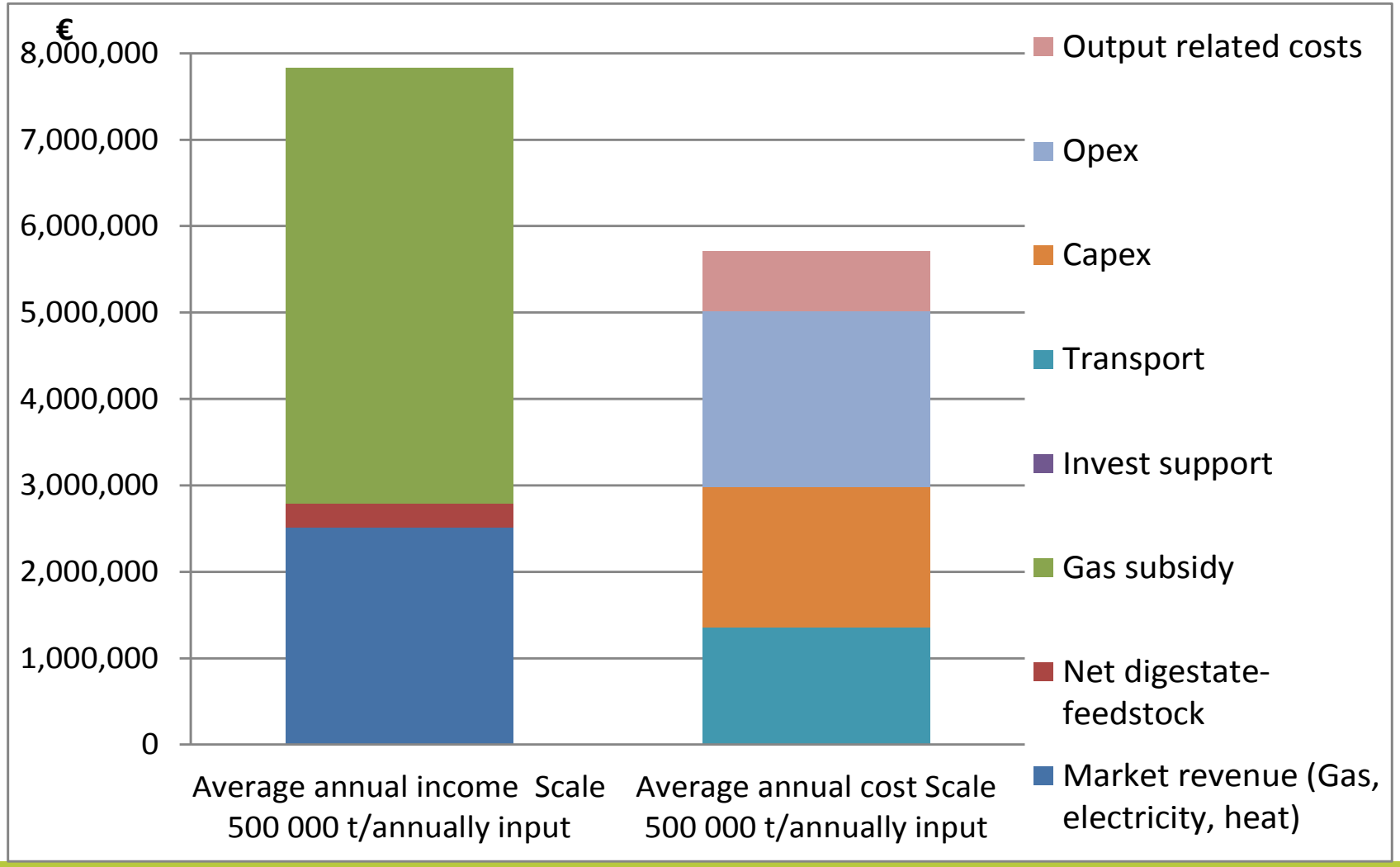
- Indirect support is provided through the regulation of farmers input use and manure treatment (manure, fertilizer, nitrogen, phosphor) - *minor effect*

Regulatory incentives in Norway

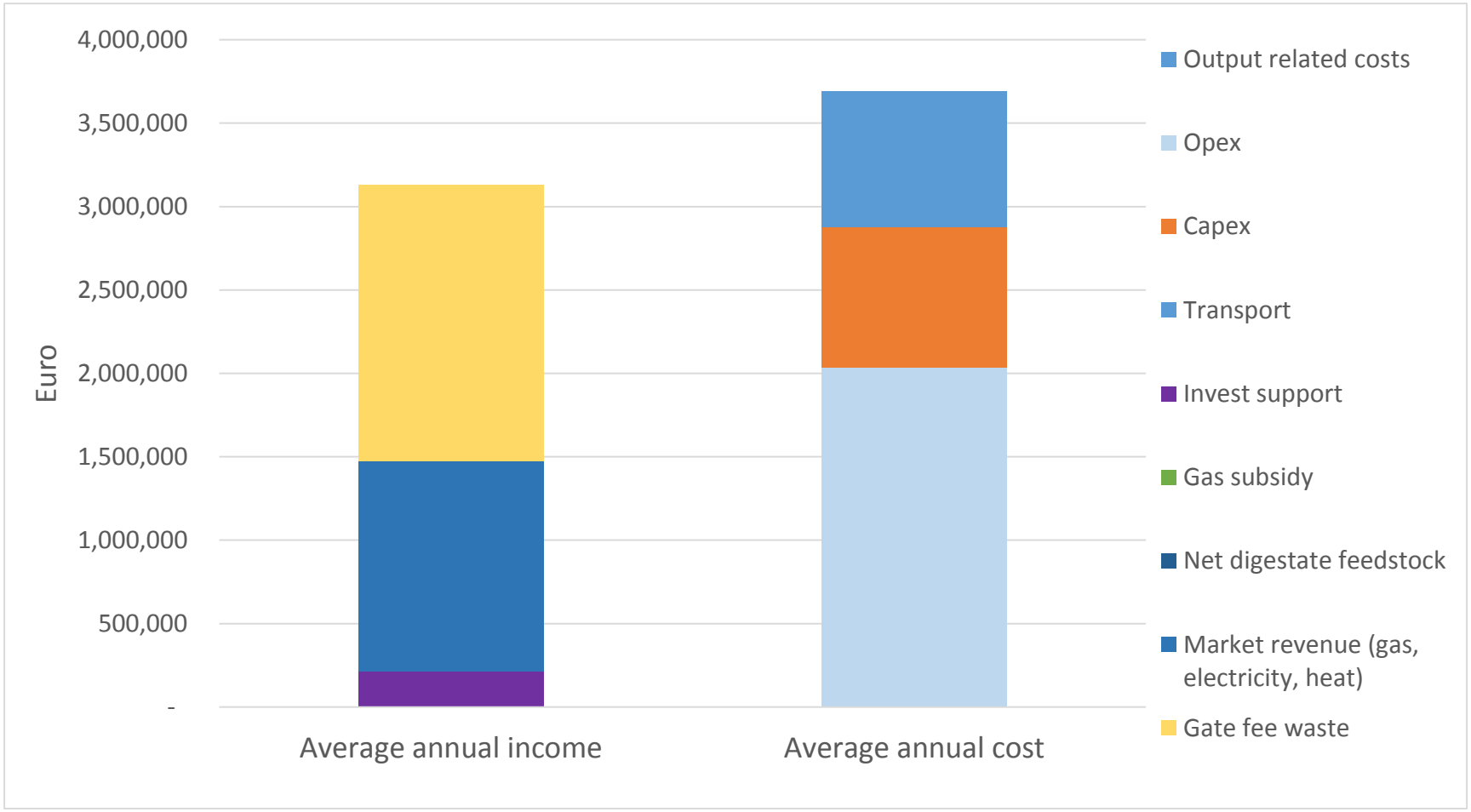
- Banned landfilling of biodegradables from 2009.
- Investment support for biogas plants
- Tax exemption for transport purposes

- Local initiatives: Østfold County tender for bus transport: Biogas as fuel

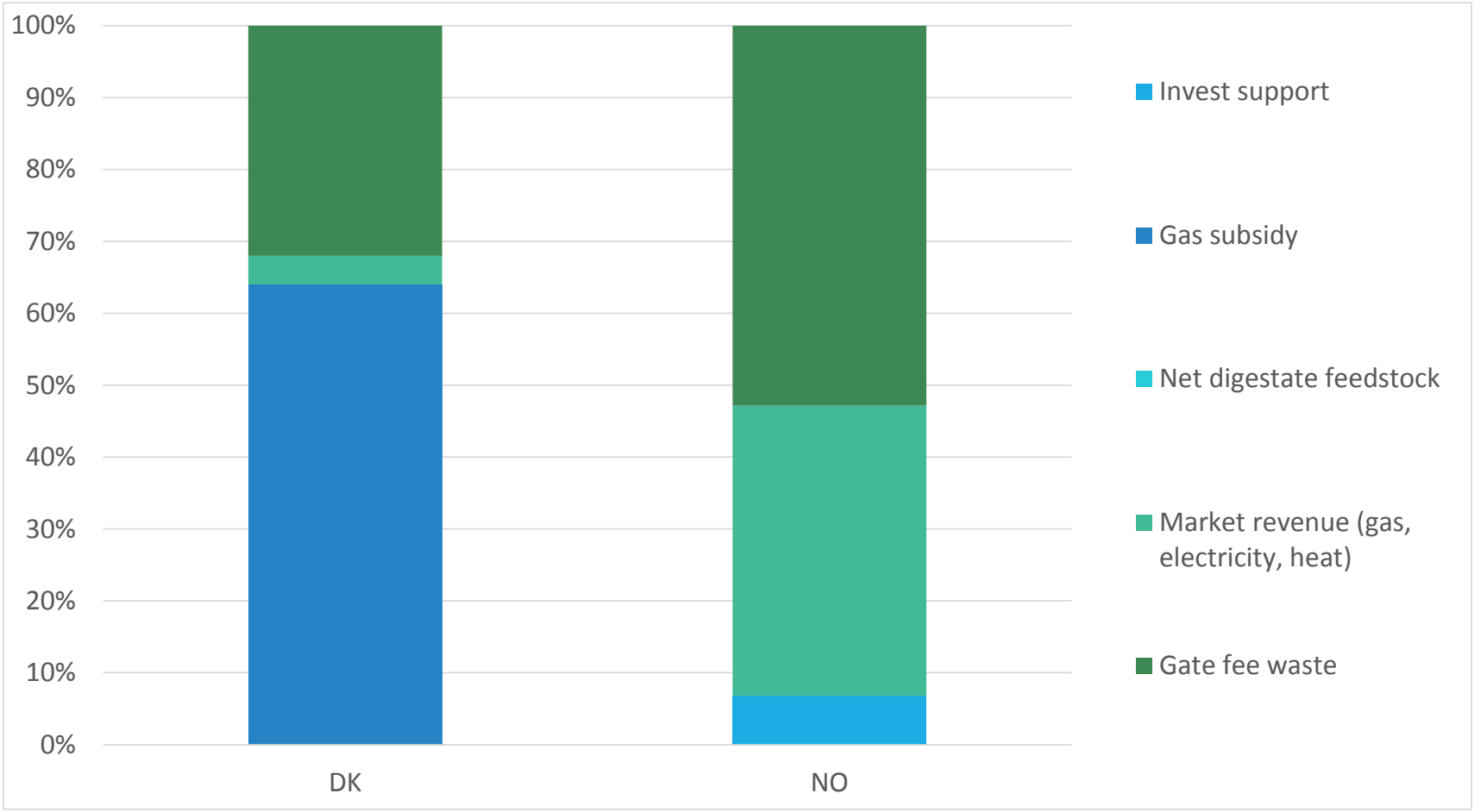
Large scale biogas plant in DK based on manure and upgrading biogas to grid (BioChain case)



Large scale biogas plant in NO (organic waste) – preliminary results



Revenue composition in DK (BioChain case, new support) and Norway



Comparison on the drivers for biogas development in Norway and DK

- Biogas development in DK is driven by the high support level for upgraded biogas to natural gas grid
- The risk involved in CHP based projects are higher even though support is at similar level as for upgrade
- For a limited amount of time the additional investment subsidy (manure) triggered the fast expansion

Biogas in Denmark and Norway

	Denmark	Norway
Drivers	Replacement of fossil energy carriers Distribution of phosphorus	Waste (water) treatment
Typical plants	Farm based plants	Central plants
Main substrates	Manure	Food waste, sewage sludge
Use of biogas	Elecricity/heat Natural gas grid	Transport (new plants) Heat (existing plants)
Use of digestate	Fertilizer	Dewatering and composting