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Biogas: From Corporate to Socio Economy

Externalities not included

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Danish Technological Institute, AgroTech

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FOODTURE LAB

About AgroTech

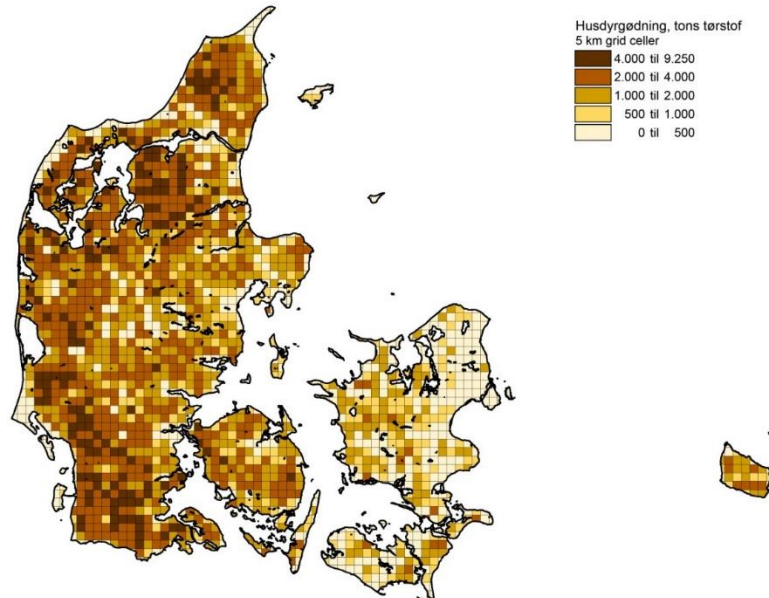


Facts on AgroTech Division

- Offices in Agro Food Park, Aarhus and Taastrup
- 90 employees
- Former Technological Service Institute (RTO) established in 2007
- Focus on plants, food and environment
- Now a division in Danish Technological Institute (RTO)

But first a swift look into recent trends in DK

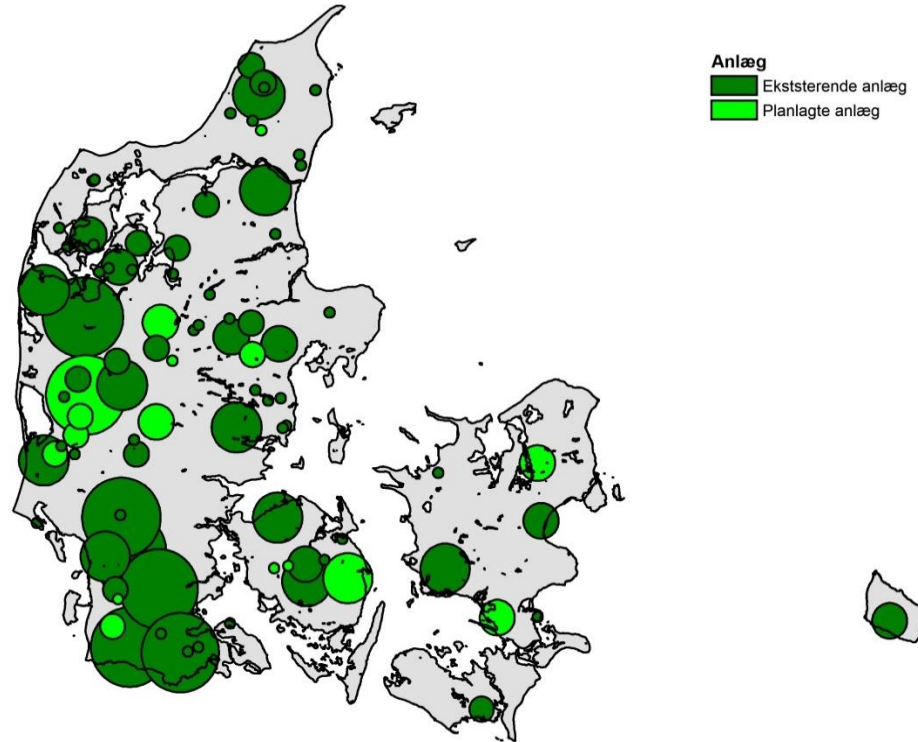
So far we have tremendous amounts of manure



Existing, planned and plants under construction (2015)



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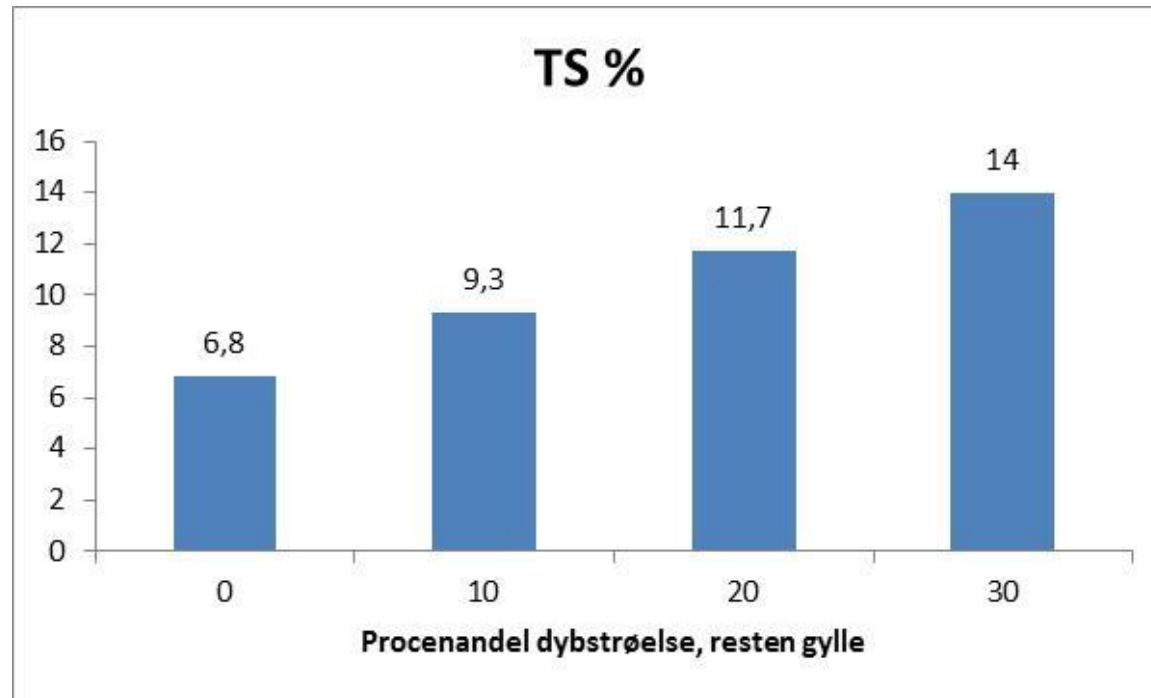


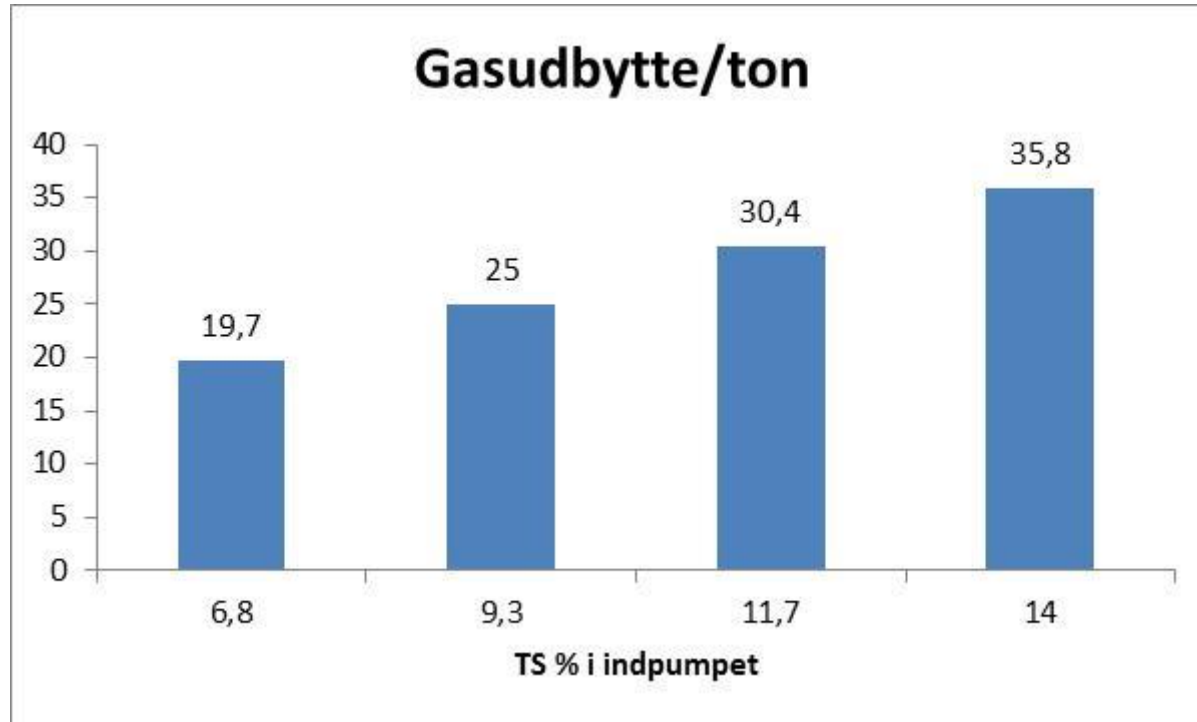
Manure production in Denmark, t/y

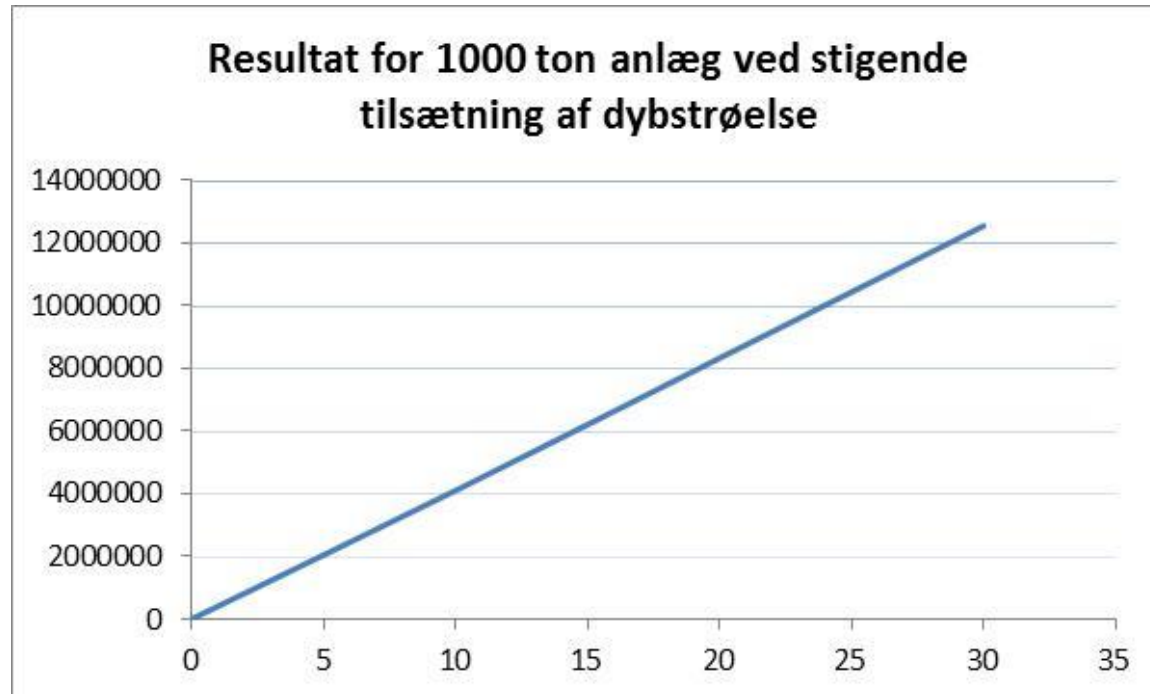


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	Liquid Manure	Deep Litter	Solid Manure	Urine
Cattle	14.893	2.594	260	201
Pigs	17.553	217	24	53
Poultry	8	308	81	0
Fur	1.578	0	0	0
Horses	0	182	0	0
Sheep	0	47	0	0
Goats	0	11	0	0
Deer	0	24	0	0
Total	34.031	3.382	365	253









Source: NGF Nature Energy



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Horsens Bioenergi. Source Bigadan



Source: Lundsby Biogas

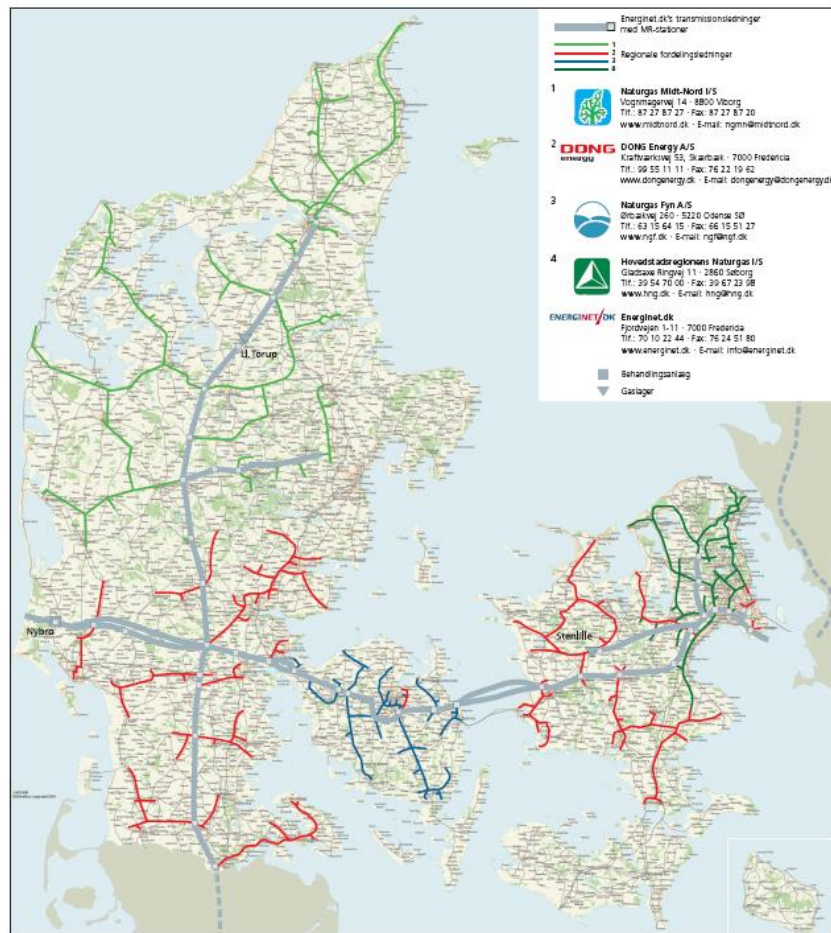


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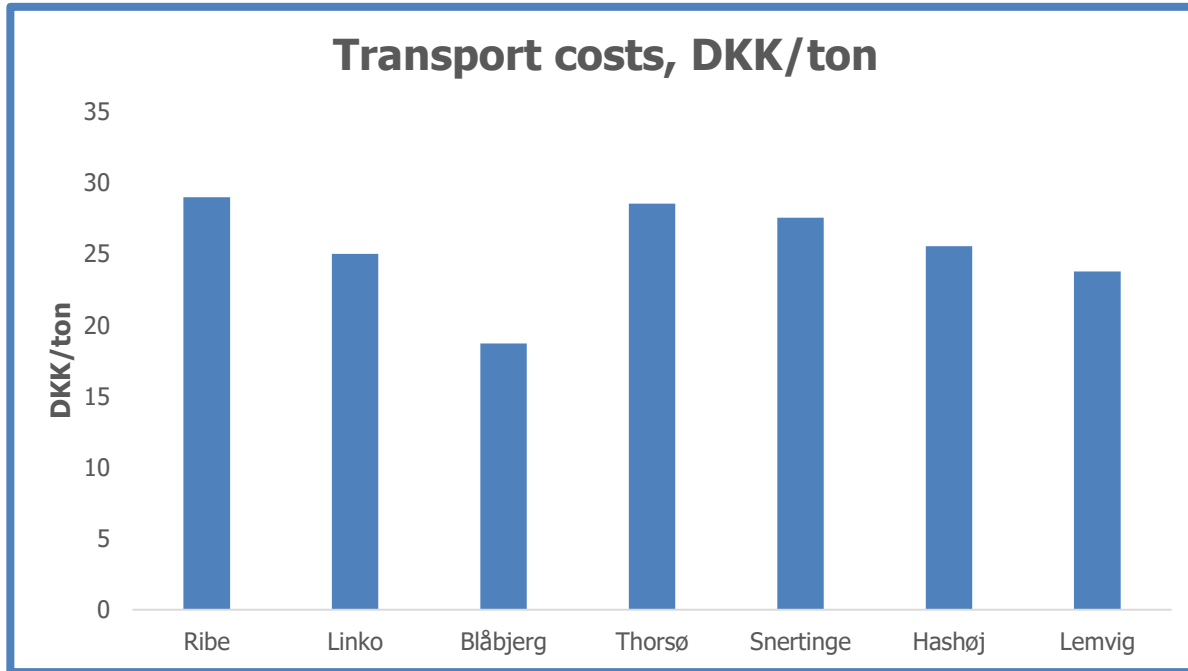
Source: Combigas

Naturgasselskabernes Oversigtskort

Transmissions- og fordelingsnet (stål) pr. 1. maj 2007



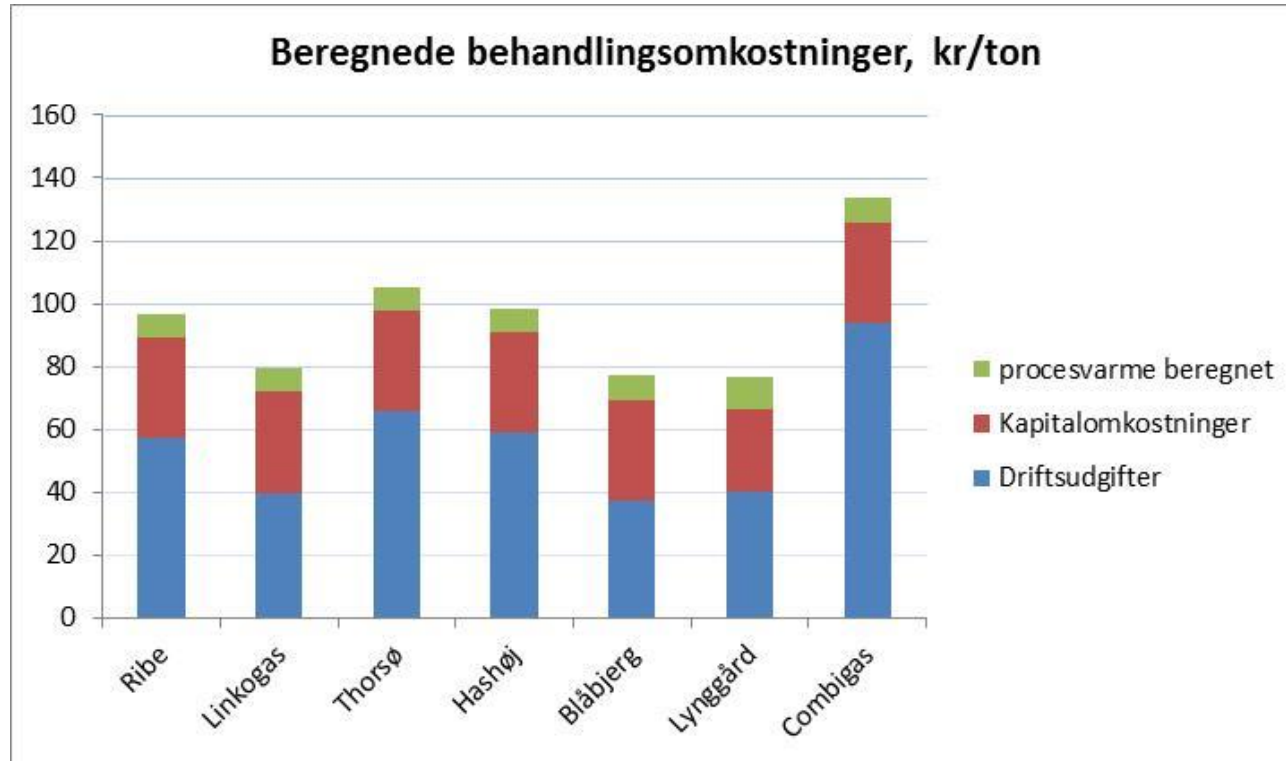
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Treatment costs, DKK/ton



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From corporate economy to socio economy

Definition – short version

- Corporate economy
- + Externalities (positive and negative)
- Taxes and subsidies
- = Socio economy



2002 one study : socio economically profitable

2013 two studies: Socio economically not profitable

But what had changed ?

Mainly assumptions on input of organic wastes and especially the externalities from it in the reference situation.



Externalities are:

Costs and benefits not reflected in the market

However, externalities can only be included or internalised if they can be quantified



It seems to me that economists are reluctant to take the effort to quantify important (positive) externalities.

They seem much more willing to include externalities (negative) which other researchers measured.



In addition, since 2002 the DEA published guidelines for socio economic calculations, which make renewable energy investments more expensive compared to the purchase of CO2 certificates.



So I have to admit I have been quite critical to the recent studies, as I believe they do not tell the full and correct story.



Important externalities are not included

- Job creation
- Odour reduction
- Goodwill (farmers)
- Decentralised power production
- Self supply and extension of lifetime of the NG grid.
-



Job creation is not included as it is assumed that the market will balance demand and supply of labour.

That means that in a situation with unemployment wages will decline until the supply meets the demand.

No way – our economy does not work like that.



Another thing: Every time politicians talk about green energy their next words are economic growth and job creation

Lars Christian Lilleholt

Minister of Energy, Supply and Climate Change.

*Denmark's success with the Green Conversion should not be judged on the local weather forecast, or the number of wind turbines we install. It must be measured on the climate in the world and on **our ability to create growth and Danish jobs.***

So why on earth is job creation not a legitimate externality ?



Quantification of odour reduction is not easy

But it is doable, there are methods to do it, but it will take quite some effort.

Willingness to pay, for example.

In 2002 we used the additional costs for slurry injection as the value of odour reduction.



Farmers goodwill

We have many indications that farmers enjoy goodwill from their neighbours when switching to digested manure

In addition the very participation in a biogas plant makes it much easier for farmers to reach the approval of plans to expand their livestock production.

That does in fact represent a value, and as such a positive externality – only it has not yet been quantified

The NG supply from the North Sea is declining

But already now 10 % in the grid is biomethane

We could either choose to close down the NG grid over a span of years or choose to distribute Russian NG, which lead us into an unwanted dependance situation

But most likely the majority of the gas can be biomethane
In relatively near future, and prolong the lifetime of the grid.



Furthermore biomethane addresses the challenge of the transition of vehicles from fossil to sustainable fuels

Now isn't that an externality that should be taken into account ?



So in my oppinion more effort has to be taken to quantify and put value on a number of obvious externalities, so that they can be internalised in socio economic analyses.



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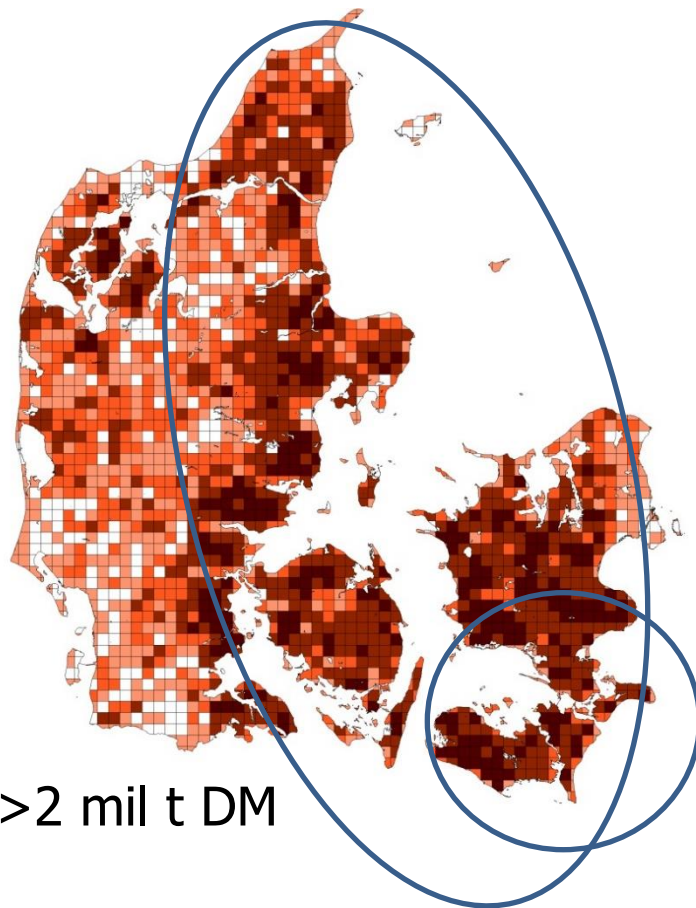
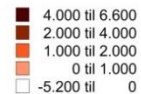
And now to something completely different

Straw and sugar beets



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Halm overskud, tons tørstof
Kvadrater a 5 km



Straw >2 mil t DM

Potential: >500 mil Nm³ CH₄

Sugar beets
40.000 ha
160.000 t DM



The project:

Flexible CHP from Biogas Based on Waste Biomass

addresses biogas from silage of mixed sugar beet leaves and straw

Objective: Can this silage mix be used to regulate biogas production in general and on demand ?

And how can this be done ?

Can we identify synergy effects ?

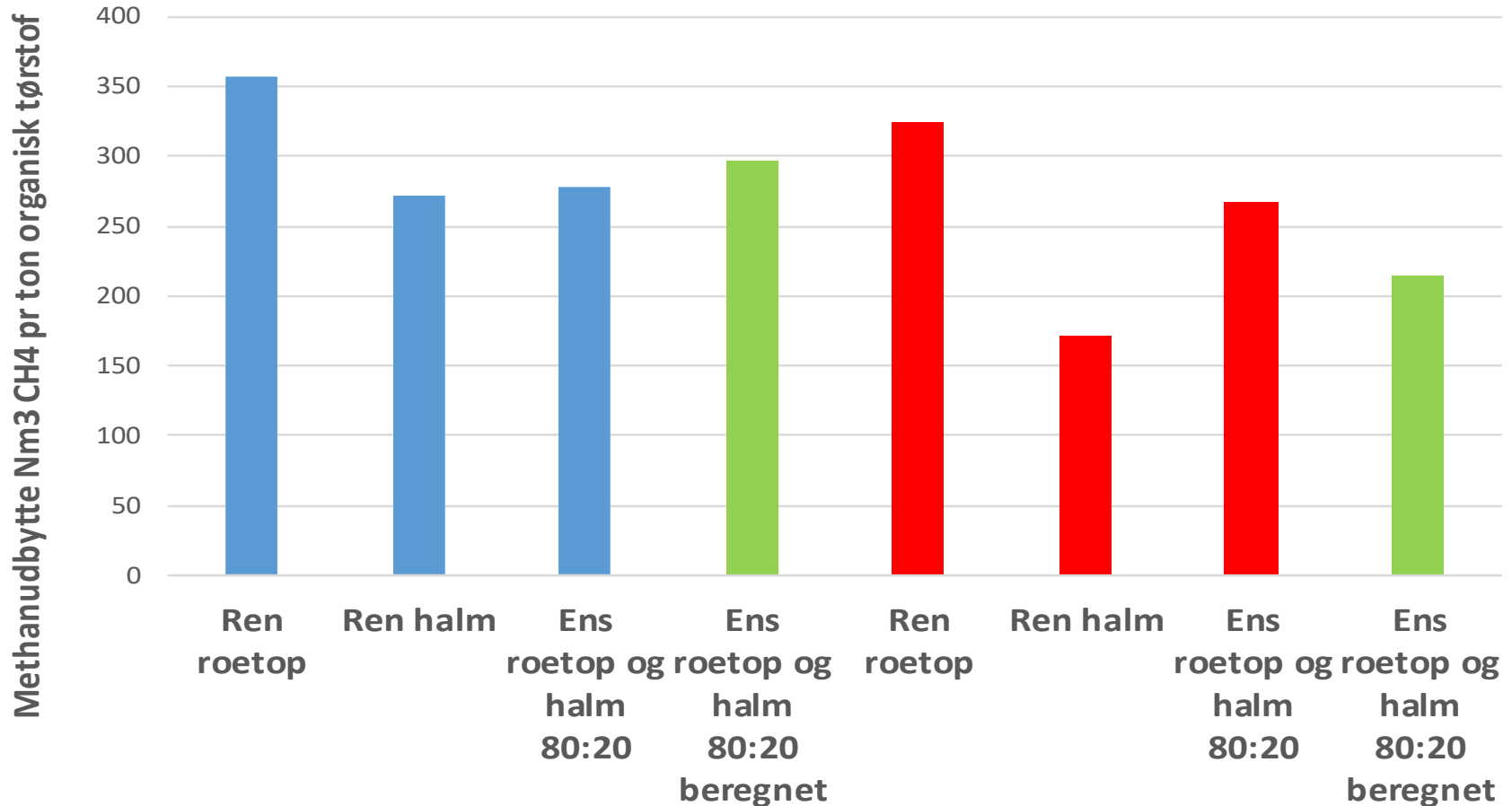


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Gennemsnitsværdier fundne og beregnede



Akkumuleret methanproduktion roetop:halm 80:20

