COASTAL BIOGAS

Cluster On Anaerobic digestion, environmental Services and nuTrients removAL

COASTAL Biogas – success stories

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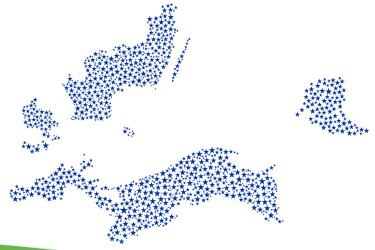

COASTAL Biogas final conference
9 December 2021

Partners FNR Fachagentur Nachwachsende Rohstoffe e.V. | Gdańsk University of Technology | BEIC | Roskilde University | Universität Rostock | Lithuanian Energy Institute

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Success story 1

COASTAL Biogas – a cost-efficient way to to mitigate eutrophication

https://www.coastal-biogas.eu/resources/Success_story_1.pdf

The WFD action plan 2015-2021 for the Køge Bay

According to the WFD action plan the nitrogen load from the Køge Bay water catchment area should be reduced by 73.1 tonnes in 2021. Some of the instruments to achieve the target involves wetlands, afforestation, wastewater treatment and low land projects, but still 51.6 tonnes have to be removed by other measures.

Here, two such measures have been investigated and compared:

1) direct reduction of nitrogen use on farmland
2) removal of nitrogen from the sea through the COASTAL Biogas concept

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Result

The amount of nitrogen entering Køge Bay needs to be reduced with 51.6 tonnes which corresponds to a direct reduction of 258 tonnes of nitrogen based on a retention level of 80%.

According to RUC 145.2 kg of synthetic nitrogen is applied per hectare farmland in the Køge Bay catchment area.

A 10% reduction in nitrogen applied on farmland results in a net cost of 30 DKK (approx. 4 EUR) per hectare.*

10% reduction of the nitrogen input on 17,769 hectares results in a reduction of 258 tonnes of nitrogen and an associated cost of 533,070 DKK or ~**72,000 EUR**

* J. Eriksen et al. Virkemidler til reduktion af kvælstofbelastningen af vandmiljøet. DCA, Århus Universitet, 2020

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COASTAL Biogas

6,360 tonnes of wet and sand free seaweed needs to be collected to remove 51.6 tonnes of nitrogen.

	DKK	Comment
Value of collected nitrogen	-380,000	Actual market price in Denmark, 7.36 DKK/kg
Value of collected phosphorus	-15,000	Actual market price in Denmark, 12.00 DKK/kg
Value of produced biogas	-1,324,000	Value of produced biogas including production subsidies, 5.77 DKK/Nm^3 methane
Collection cost	1,647,000	Estimated cost for collection, 185 DKK/tonne of seaweed incl. sand
Transport cost	30,000	Estimated cost for transport, 0.85 DKK per tonne and km of seaweed incl. sand
Production cost	246,000	Cost for production, fixed and variable, based on financial accounting for Solrød Biogas 2018 and 2019
TOTAL COST	**204,000**	**~27,400 EUR**

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Cost for 51.6 tonnes reduction of nitrogen

Direct reduction: ~72,000 EUR

The COASTAL Biogas concept: ~27,400 EUR

In case the seaweed is collected anyway (smell, tourism etc) the COASTAL Biogas concept results in a profit of more than 1.4 MEUR!

The COASTAL Biogas concept is implemented in the Solrød Biogas plant

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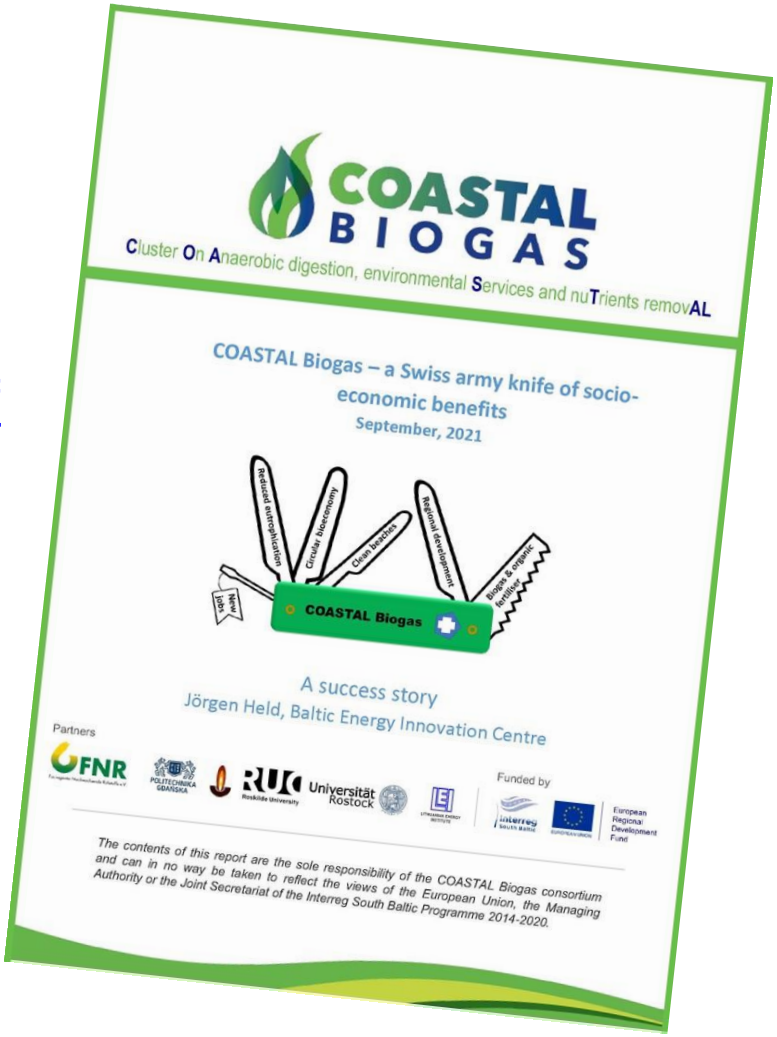
Success story 2

COASTAL Biogas – a Swiss army knife of socio-economic benefits

https://www.coastal-biogas.eu/resources/Success_story_2.pdf



20 Socio-economic benefits

1) Reduced eutrophication
2) Improved water quality
3) Improved access to the sea
4) Reduced smell
5) Less flies
6) Increased value of coastal properties
7) Reduction of spontaneous methane and H_2S emissions
8) Production of an organic fertiliser
9) Production of biogas
10) Creation of a local value chain, and regional development
11) New job opportunities
12) Increased security of supply
13) Diversification of the energy system
14) Transition to a circular bio-economy

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20 Socio-economic benefits

15) Education
16) Identity (cf. Neringa)
17) Continued agricultural activities
18) Fulfilment of local climate action plans
19) Fulfilment of the nitrogen directive
20) Fulfilment of the Water Framework Directive

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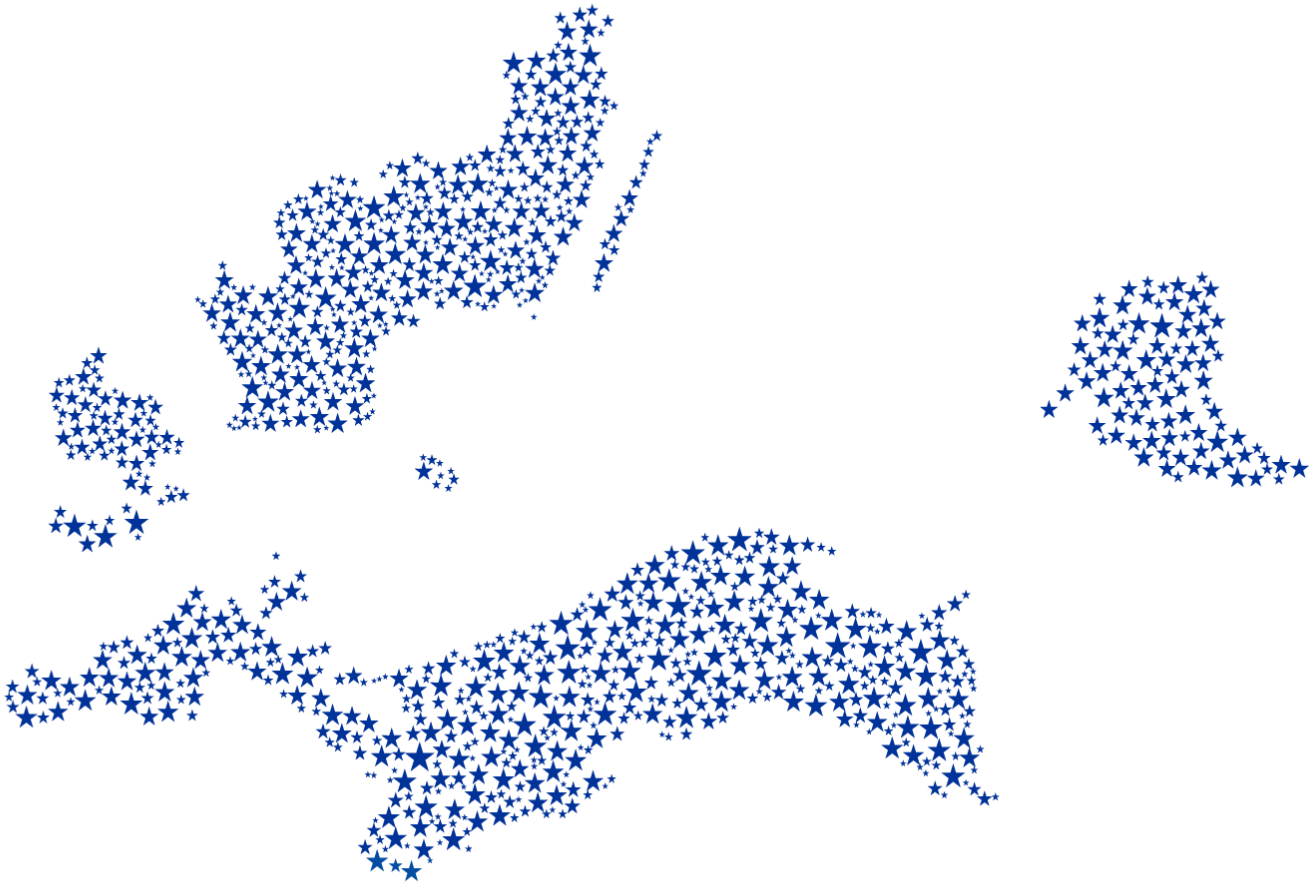
Thank you!



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