

# BioFuels for transport – production, use and co- operation

## Umbrella Seminar

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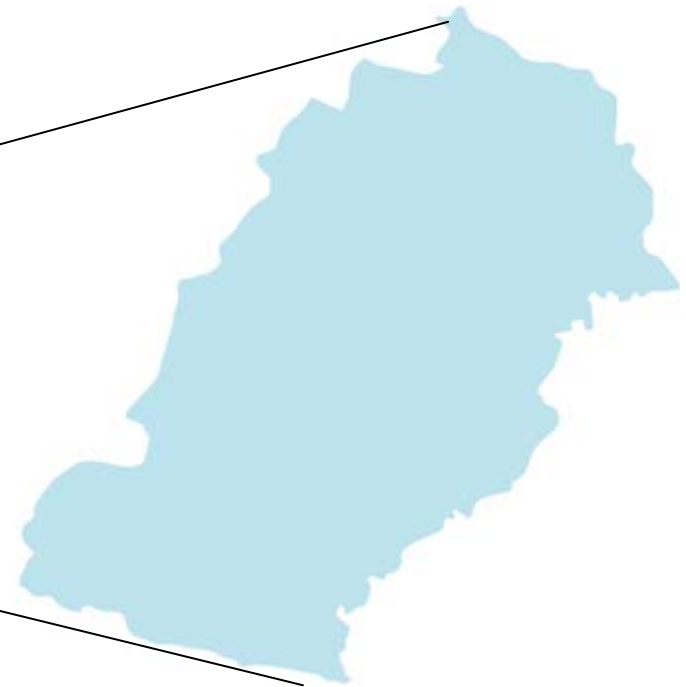
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BioFuel Region™

**A world-leading region in sustainable transport based on fuels, energy and bio-products from renewable rawmaterials.**



## BioFuel Region – where?



**225 464 km<sup>2</sup> (Holland 41 500 km<sup>2</sup>)**



# BioFuel Region™



**108 300 km<sup>2</sup> forest area**  
**2 800 km<sup>2</sup> agricultural area**  
**877 400 people**  
**44 municipalities**  
**4 counties**  
**4 universities**



# The triple challenge





# Vision and goals

BioFuel Region – a world-leading region in sustainable transport based on biofuels, energy and bio-products from renewable rawmaterials.

*...not only about production of biofuels, it is about people and changing attitudes...*

## **Therefore we focus upon**

- being in the forefront of societal change
- increasing availability of renewable rawmaterials
- industrial and regional development



# BioFuel Region™



The work carried out together in a dialogue and process!

## Enabling a system shift towards renewable fuels

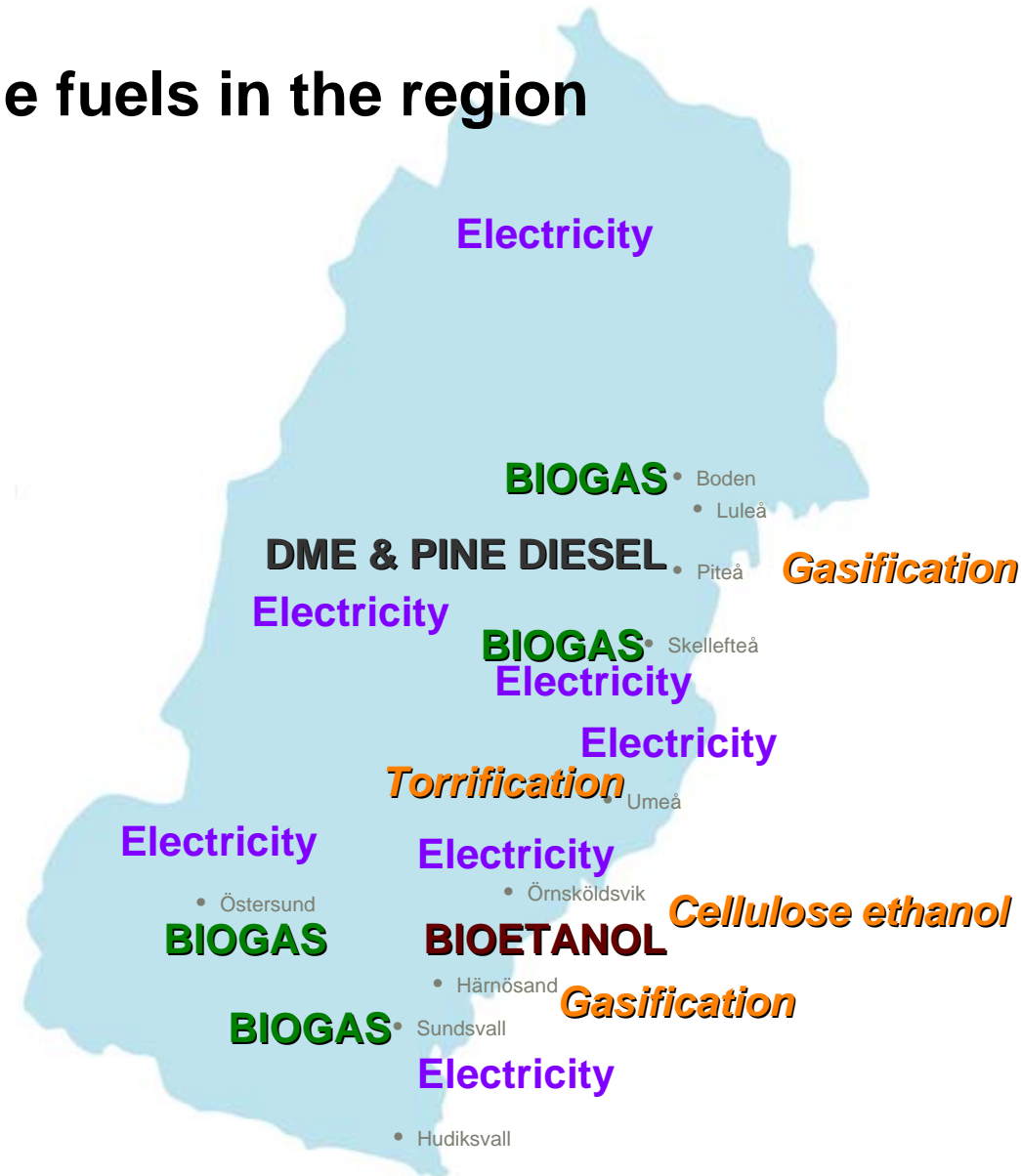




## Large production of renewable fuels in the region

- Bio-ethanol from cellulose in Örnsköldsvik
- Production of bioCNG derived from sludge and waste in Skellefteå, Sundsvall, Boden and Östersund.
- Production of DME from biomass gasification in Piteå - pilot plant. Pine diesel.
- Electricity production from biomass

- Pilot plant for cellulose ethanol in Örnsköldsvik
- Pilot plant for gasification in Piteå and Härnösand
- Pilot plant for torrefication in Umeå



BioFuel Region™

Projekt för att stärka omställning till förnybara drivmedel



**Biogas Norr**

Färdplan biogas AC/BD



**KNUT-  
projektet**



Framtidens skotrar



**SECRE**

Social Enterprises in Community  
Renewable Energy



## Strong networks - Biogas Norr

- A networking and regional co-operation for biogas actors in the four northern counties
- Biogas Norr wants to increase production and value of biogas in northern Sweden
- Communication, engagement and co-operation
- Powered by BioFuel Region



# Biogas & natural gas = methane

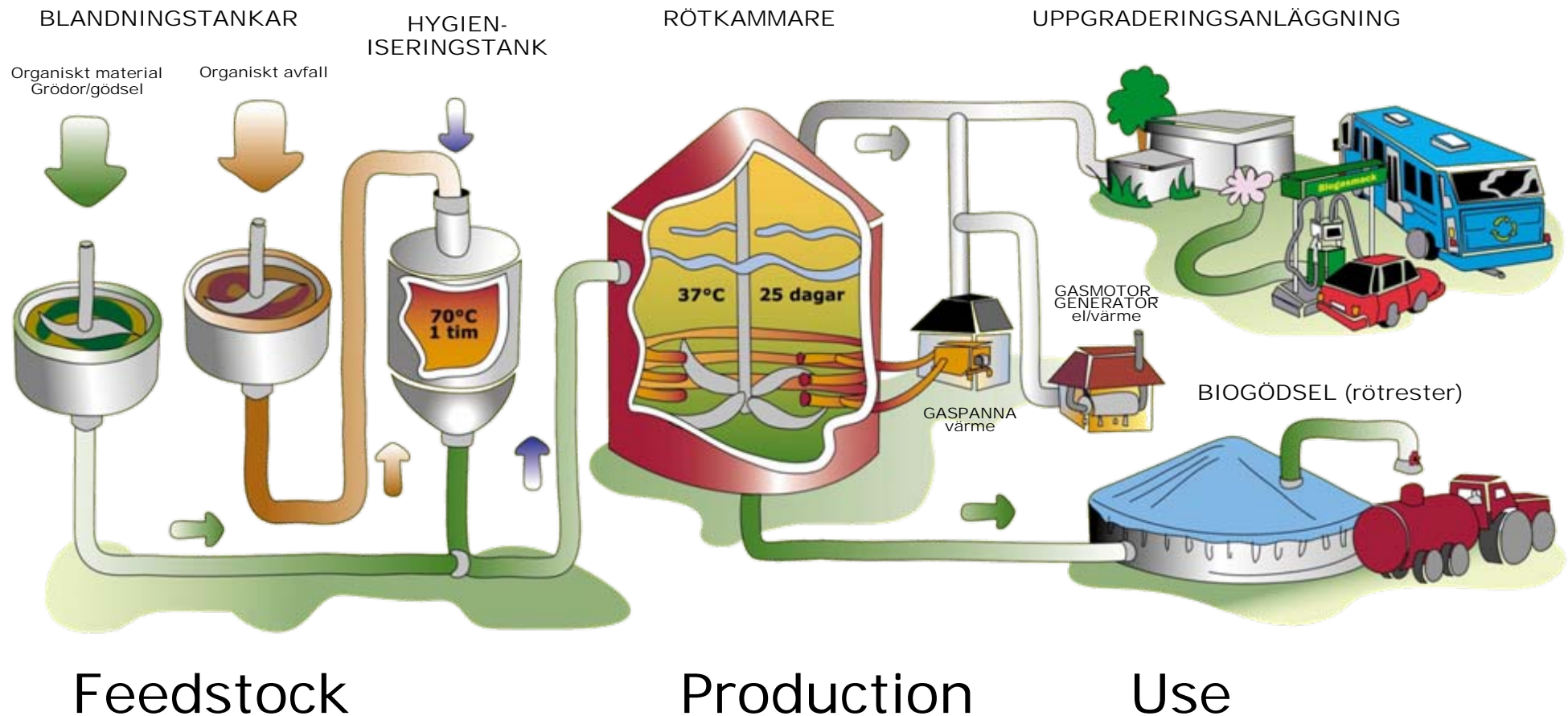
Anaerobic digestion of organic material



Biogas Norr



# Biogas - production and use

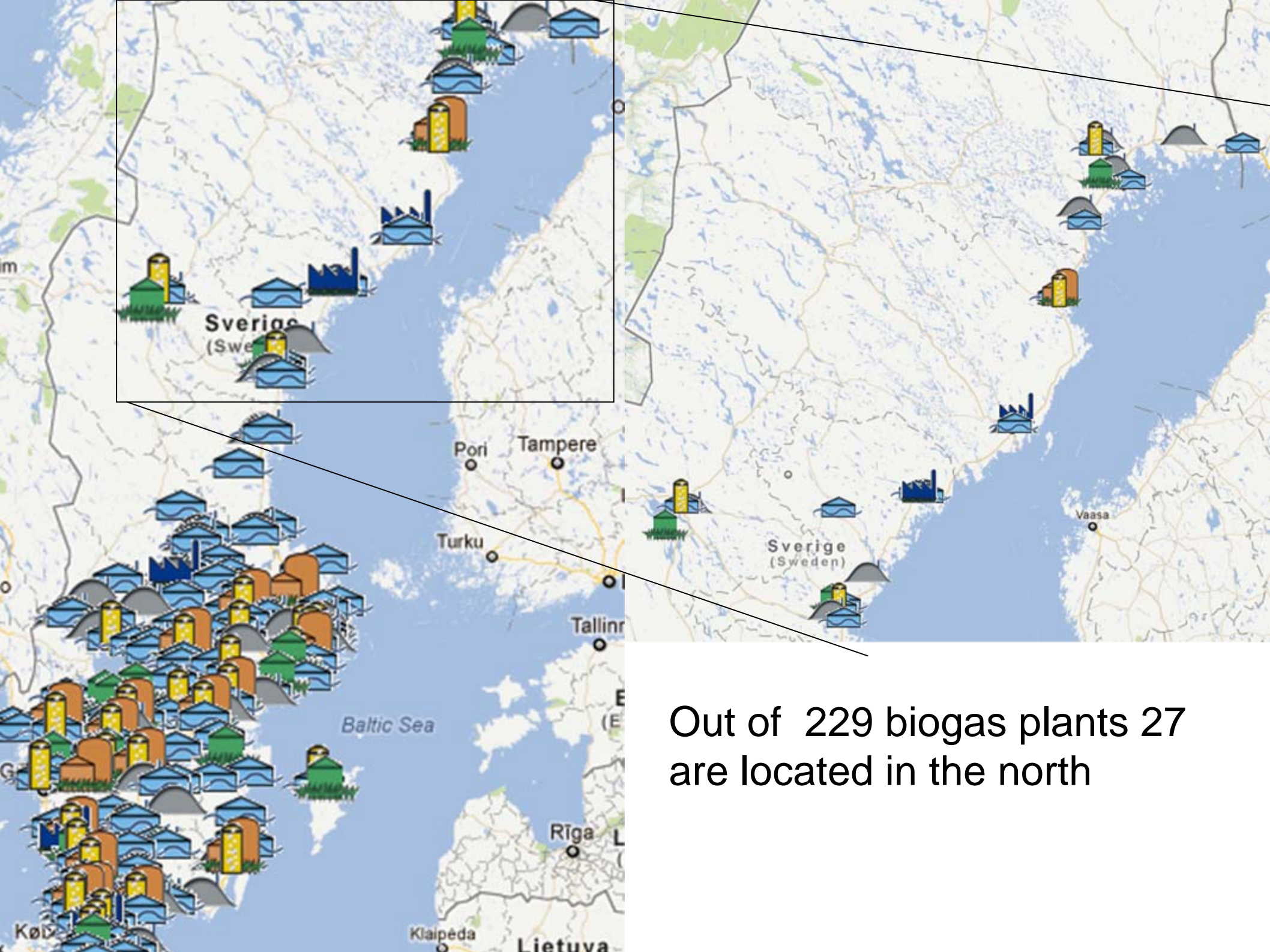


## Biogas – potential feedstock in northern Sweden?

- Industrial waste water (paper industry, dairy)
- Waste water sludge
- Food waste from households
- Food waste from restaurants and shops
- Manure
- Offal (meat and fish)
- Energy crops (red canary grass, clover, hemp)
- Other organic waste



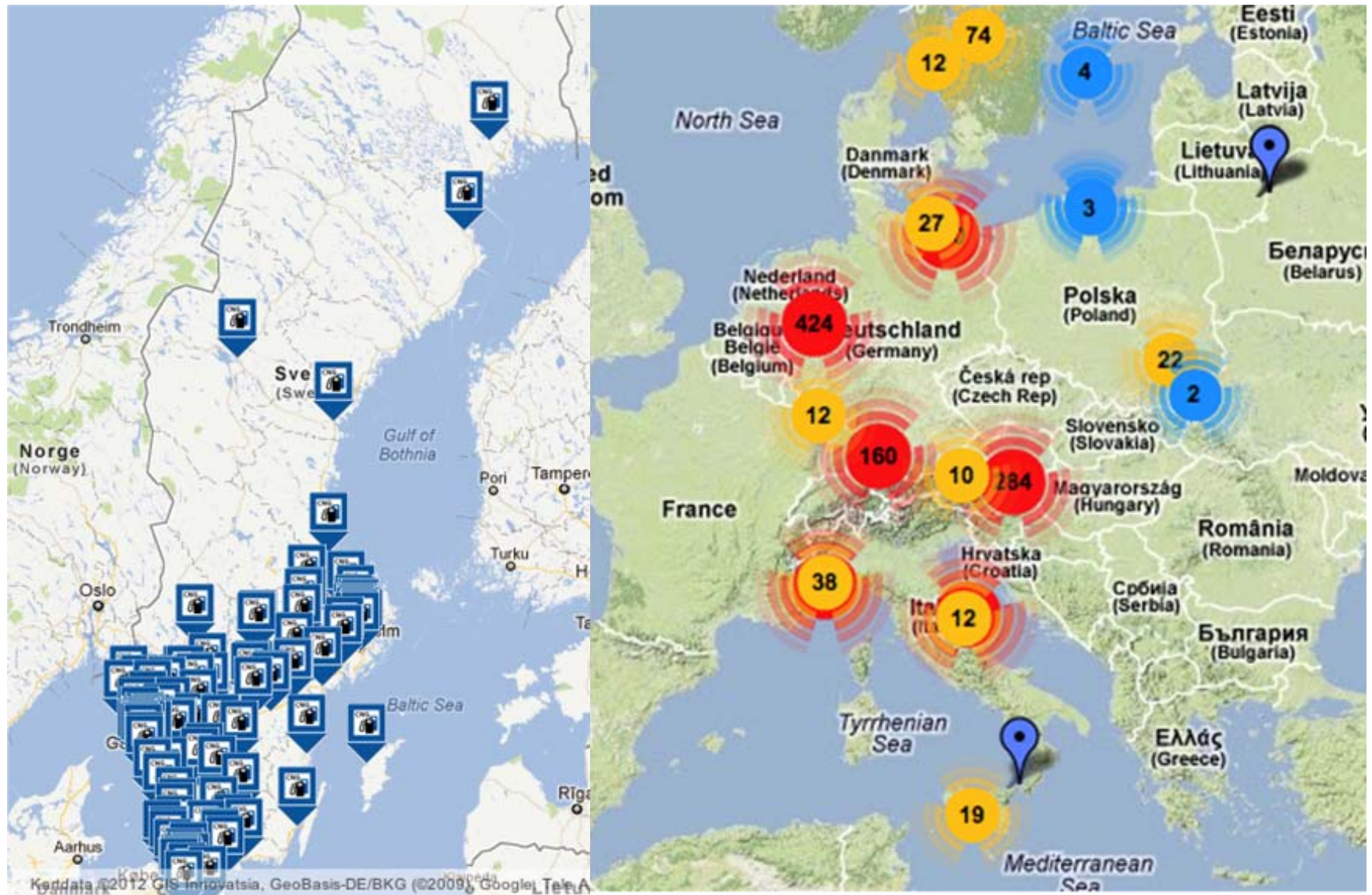




Out of 229 biogas plants 27 are located in the north



## Gas filling stations in Sweden and Europe





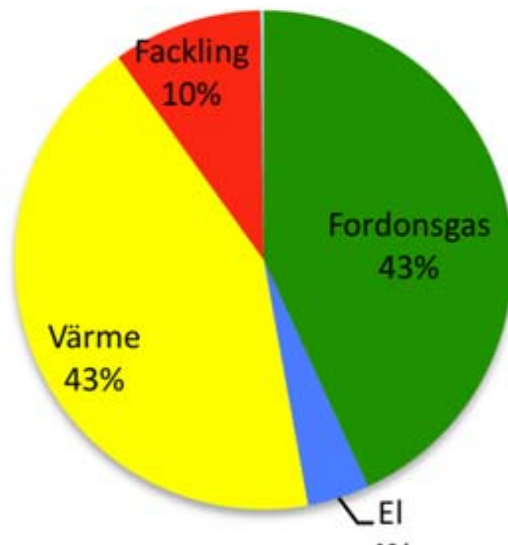
## Biogas production in Biogas Norr

- 184 GWh the year 2011 (1384 GWh in Sweden)  
corresponds to 20 millions of liter gasoline or 20 000 cars that drive 15 000 km/year
- Operational problems and lack of feed stock lowered the production by 15%

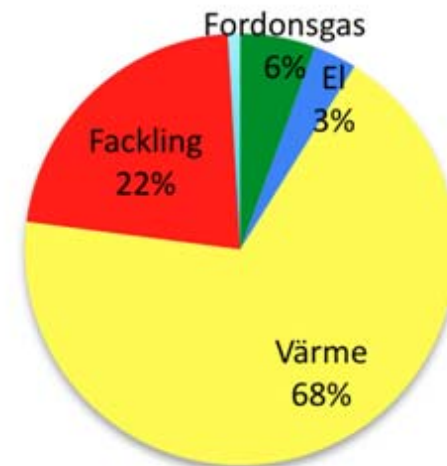
## Biogas use in Sweden and Northern Sweden

- 22 % flared - corresponds to 4,3 millions of liter gasoline
- 6% bioCNG - 1,1 millions of liter gasoline
- High percentage of heating

Biogasanvändning i Sverige 2010



Biogasanvändning i de 4 nordligaste länen 2010





## Potential for biogas in northern Sweden

- Maximise the use of existing infrastructure
- Increase the value of existing biogas
- New production from energy crops/manure/offal och paper mill industry.

## Potential overview for bioCNG market in northern Sweden

	bioCNG (GWh)	Cars	Trucks	Buses
Total number of vehicles in northern Sweden 2011		455 000	62 000	1800
2011	11	1100		44
2016 (prognosis)	300	30 000		1 200
2030 (vision)	2 000	200 000		8 200

Biogas is one part of the solution, but not the only one!



***Thank You***

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## Recognition that one solution is not enough!

*...and  
remember... it's  
not one or the  
other... it's all of  
them!*

