Nils Lagerroth

- Co-ordinator at Swedish Rural Network Support Unit
- Live on a farm outside the village of Brålanda in western Sweden

The Swedish Rural Network

EUROPEAN UNION
European Structural and Investment Funds

I would like to talk about:

- Biogas Brålanda
- Situation for Biogas in Sweden
- Activities within the Swedish Rural Network

The Swedish Rural Network

EUROPEAN UNION
European Structural and Investment Funds

Biogas Brålanda

- Started 2013
- Unique concept with 4 local farm facilities linked together in a common grid
- Production capacity 12 GWh/year
- Produces gas for 1800 cars

The Swedish Rural Network

EUROPEAN UNION
European Structural and Investment Funds

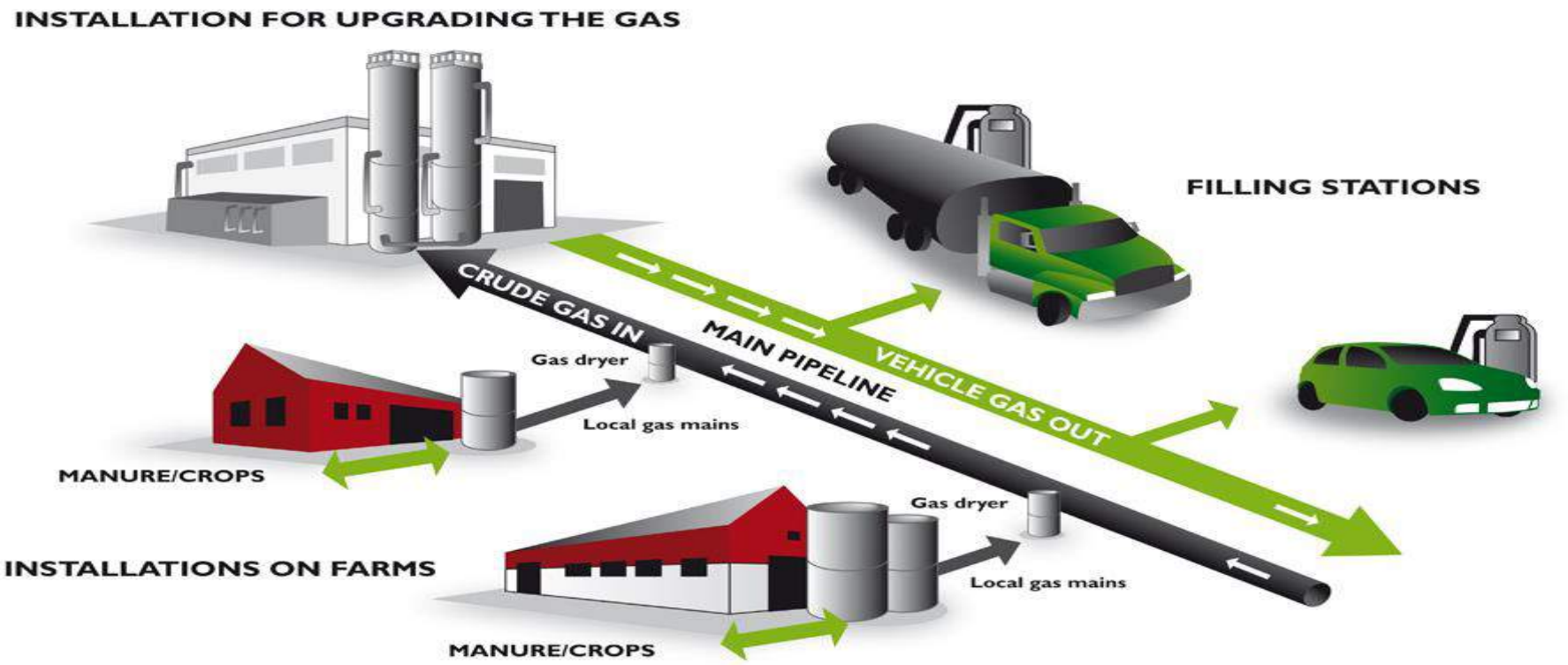
How it works

- Manure is digested for **15 to 30 days** in the farm system. Each ton of manure gives about 15 cubic meters CNG (biogas converted to vehicle fuel).
- The gas is sent into **the grid,** pressurized and transported to the upgrading plant.
- The **upgrading plant** purifies raw gas from carbon dioxide into a content of 97% methane.
- The biogas for vehicles is transported to the **filling station** for tanks and to the public filling station in Brålanda.

The Swedish Rural Network

EUROPEAN UNION
European Structural and Investment Funds

Principle for Biogas Brålanda



The Swedish Rural Network

EUROPEAN UNION
European Structural and Investment Funds

Local Biogas Grid

The Swedish Rural Network

EUROPEAN UNION
European Structural and Investment Funds

Production capacity per plant

Name	[GWh/year]	Substrate
Bergungen	1,6	Pig manure and Slaughterhouse waste
Sylves Lantbruk	3,7	Pig and livestock manure and Slaughterhouse waste
Espesäter	3,5	Pig and livestock manure and Slaughterhouse waste
Qvantenburg	3,3	Pig manure and Slaughterhouse waste

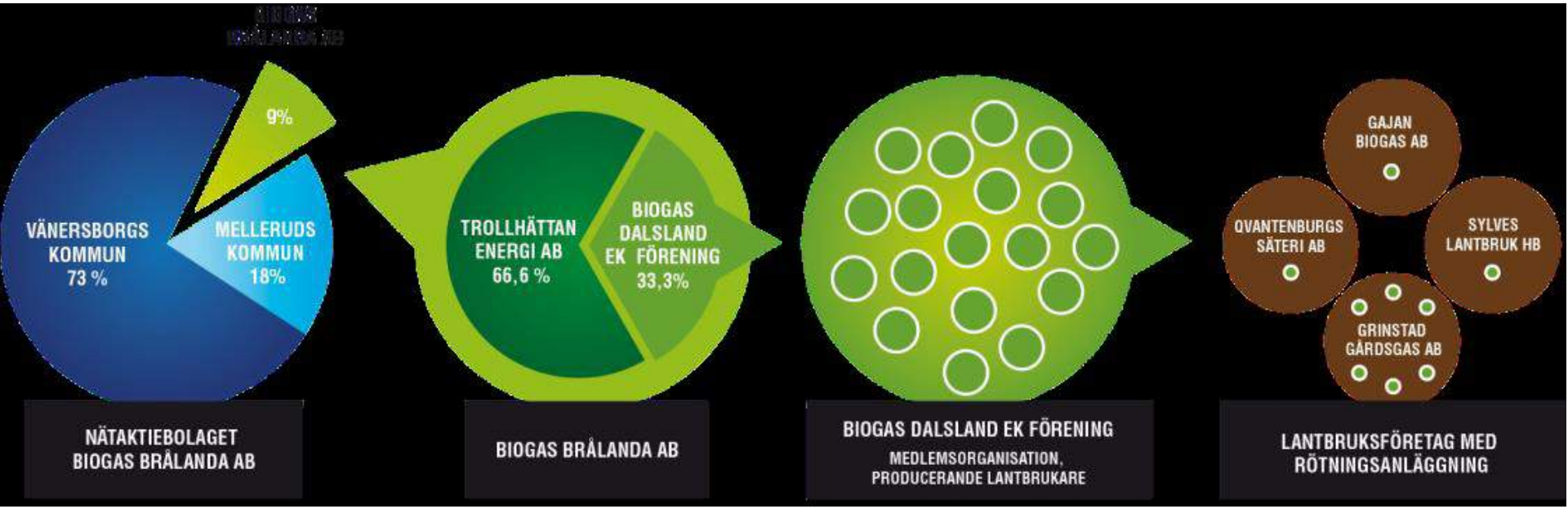
Total 12,1 GWh/year

Business model – stakeholders interest

- **Farmers** – producing biogas with a profit
- **Energy Company** (Trollhättan Energy) – selling the gas and using the gas for local community owned buses
- **Local authorites/municipalities** (Vänersborgs and Mellerud) – controlling the grid, promoting local businesses and fulfilling environmental goals.

The Swedish Rural Network
EUROPEAN UNION
European Structural and Investment Funds

Business structure



Owner of The Grid

Upgrading, distribution

Cooperative
18 members

Farmers

The Swedish Rural Network

EUROPEAN UNION
European Structural and Investment Funds

Investment costs

- Farm based **biogas plant** is between 6- 10 million SEK (€ 0,6-1,0 million).
- An **upgrading plant** costs around 10 million SEK (€ 1,0 million).
- The **grid** with pipelines costs around 10 million SEK (€ 1,0 million),
- **Filling station** for cars and tanks 8 million SEK (€ 0,8 million).
- Total around **€ 8 million**

The Swedish Rural Network

EUROPEAN UNION
European Structural and Investment Funds

Financing the investments

- Farm production plants
  - 30% Rural Development Program
- Upgrading plant, grid, filling stations
  - 30% National Climate Support Program

The Swedish Rural Network

EUROPEAN UNION
European Structural and Investment Funds

Pre-studies/projects

2005-2006	Exploring possibilities for biogas production in the Brålanda **0,8 mill. Euro**
2006-2007	Evaluating organisational forms and forming a business group **0,3 mill. Euro**
2007-2009	Concept for efficient and large-scale biogas production from farm level and business model where production is part of the entire value chain **3,7 mill Euro.**

The Swedish Rural Network

EUROPEAN UNION
European Structural and Investment Funds

Collaboration is the key

Close collaboration between

- Farmers,
- Municipalities,
- Innovatum (a high tech development centre in Trollhättan),
- Hushållningssällskapet West(the Rural Economy and Agricultural Society),
- Local organizations,
- Energy and technology companies and
- Several other stakeholders.

The Swedish Rural Network

EUROPEAN UNION
European Structural and Investment Funds

Double environmental benefit

- **No emission** of greenhouse gases when driving
- Involuntary **leakage** of methane gas from the storage and when spreading of manure is **avoided** (closed system)
- Growing **crops** will **easier** take up the **nutrients** from the digested residue compared to untreated manure.
- **Lower** risk of **leakage** into rivers and lakes.

Greenhouse gas emissions are reduced by up to 170%, compared to fossil fuels.

The Swedish Rural Network

EUROPEAN UNION
European Structural and Investment Funds

Experiences - Biogas Brålanda

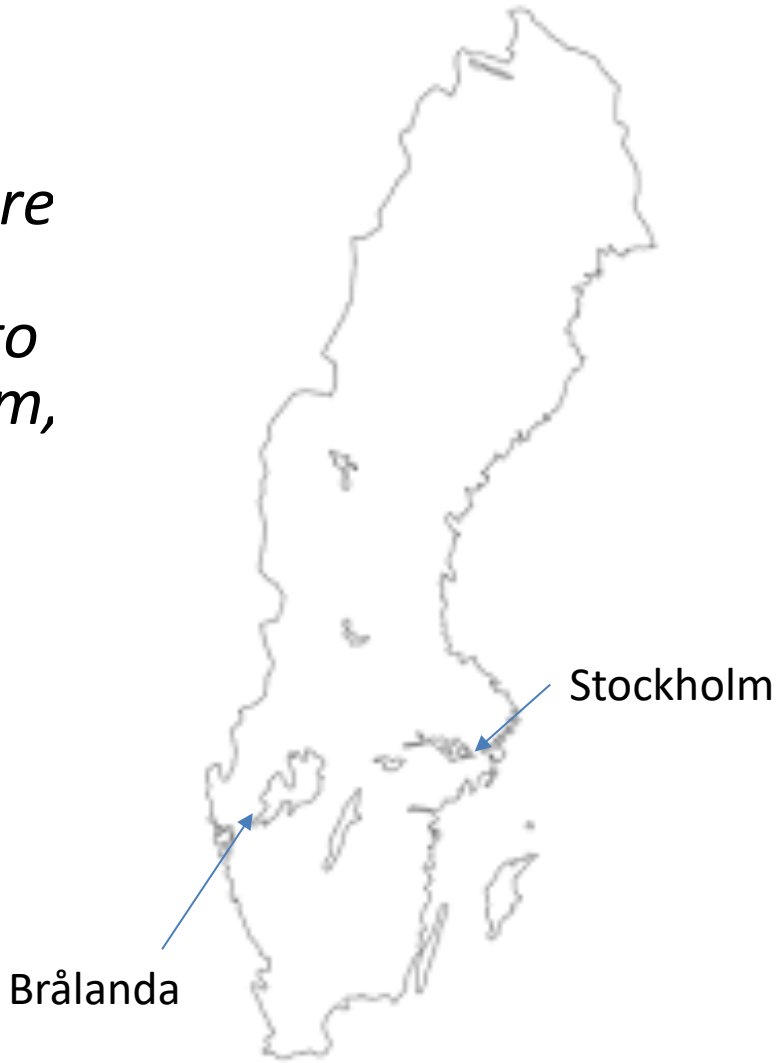
- Start-up problems due to new technology
- Full capacity today – working well
- Farmers involvement in business chain early secured
- One bigger plant compared to 4 small would have been preferred
- New plant for 8 GWh/year will start (most likeley) next year
- Local mobilisation for Biogas cars in Brålanda

The Swedish Rural Network
EUROPEAN UNION
European Structural and Investment Funds

Quiz

Taking the yearly production of manure for one year, how many pigs are needed to produce biogas sufficient to drive a car from Brålanda to Stockholm, 450 km?

1. 2 pigs
X. 20 pigs
2. 200 pigs



The Swedish Rural Network

EUROPEAN UNION
European Structural and Investment Funds

Biogas in Sweden

- Total biogas production is 1.8 TWh (2015)
  - Produced at 277 biogas plants, including
  - 37 farm-scale biogas plants producing 44 GWh

Total energy potential of anaerobic treatment of agricultural wastes is 14 TWh, divided into

- 2.7 TWh from manure,
- 3 TWh from crop residues and
- 8 TWh from energy crops

Why not more biogas from farms?

- Low profitability
- Many regulations/Bureaucracy
- Competition from Denmark
- Lack of trust in longterm policy for biogas production
  - Grant for methane reduction will end 2023
- No interest in long term investments
  - Aging farm population
  - Low confidence in long term food production

The Swedish Rural Network

EUROPEAN UNION
European Structural and Investment Funds

Rural areas supplies fossil-free energy

Campaign from Swedish Rural Network 2018

- Articles with best practicies
- Short films on social media
- Regional seminars

www.landsbygdsnatverket.se/fossilfritt

The Swedish Rural Network

EUROPEAN UNION
European Structural and Investment Funds

Thank you

Nils Lagerroth

Swedish Rural Network

nils.lagerroth@jordbruksverket.se

www.landsbygdsnatverket.se

The Swedish Rural Network

EUROPEAN UNION
European Structural and Investment Funds