

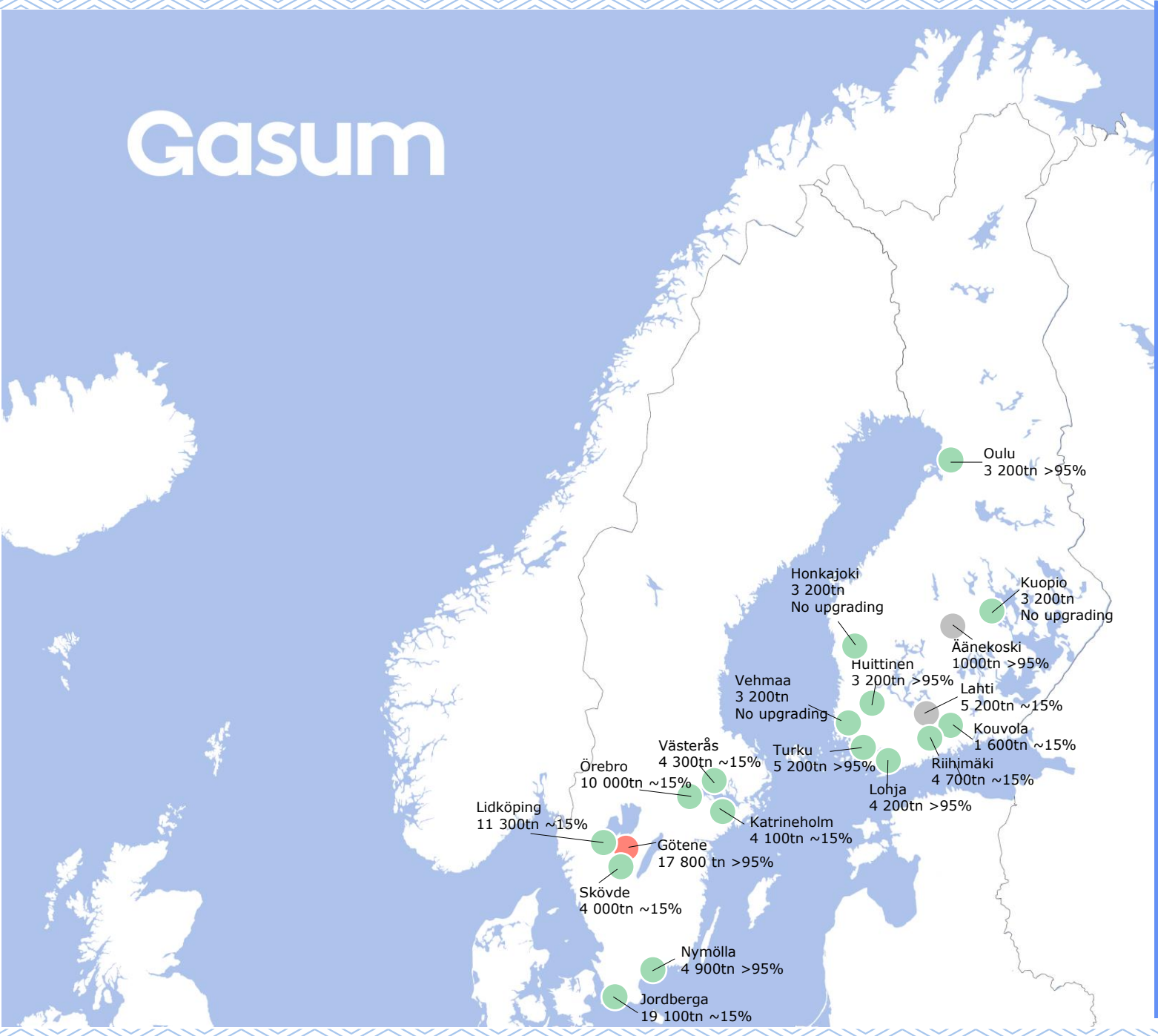


Gasum HACKATHON: Biogenic CO₂ to use

19.12.2022

Gasum

Gasum



CO₂ POTENTIAL OF GASUM BIOGAS

All CO₂ in produced biogas: 114 000 tn/a

- 40 000 tn/a at > 95 % CO₂ conc.
- 64 000 tn/a at ~15 % CO₂ conc.
- 10 000 tn/a – no current CO₂ stream (no upgrading)

*Note that potentials are indicative maximum potentials – actual production is depending on operation

- Gasum biogas plant
- Gasum upgrading plant
- Gasum biogas plant under construction

TOTAL GASUM BIOGAS CO2 POTENTIAL

CURRENT CO₂ POTENTIAL IN GASUM PLANTS In operation + under construction (Götene)		
Sweden		Current methane prod
>95% CO ₂ concentration (membrane and amine scrubber)	tn CO ₂ /a	22 600
~15% CO ₂ concentration - water scrubber	tn CO ₂ /a	52 900
Finland		
>95% concentration (membrane and amine scrubber)	tn CO ₂ /a	16 900
~15% concentration - water scrubber	tn CO ₂ /a	11 600
Currently no upgrading	tn CO ₂ /a	9 500
TOTAL GASUM		
>95% CO ₂ concentration (membrane and amine scrubber)	tn CO ₂ /a	39 600
~15% CO ₂ concentration - water scrubber	tn CO ₂ /a	65 600
All Gasum CO ₂ from current upgrading	tn CO ₂ /a	104 100
All Gasum CO ₂ including raw biogas	tn CO ₂ /a	113 700

Plant specific CO₂ potential

FINLAND

Existing & FID decision made												
Plant		Kuopio	Vehmaa	Honkajoki	Turku	Riihimäki	Oulu	Lohja	Kouvola	Huittinen	Lahti upgrading	Äänekoski upgrading
Upgrading technology		Water scrubber	No upgrading	No upgrading	Membrane	Water scrubber	Membrane	Membrane	Water scrubber	Membrane	Water scrubber	Membrane
Methane	GWh/a	30	30	30	50	45	30	40	15	30	50	8
Calculative CO ₂	tn/a	3 200	3 200	3 200	5 300	4 700	3 200	4 200	1 600	3 200	5 300	1 000
CO ₂ stream concentration (purity) estimate	%	~15%	No	No	>95%	~15%	>95%	>95%	~15%	>95%	~15%	>95%

SWEDEN

SWEDEN Existing & FID decision made										
Plant		Örebro	Lidköping	Jordberga	Västerås	Katrineholm	Skövde	Nymölla	Götene (2024)	
Upgrading technology		Water scrubber	Water scrubber	Water scrubber	Water scrubber	Water scrubber	Water scrubber	Membrane	Amine scrubber	
Methane	GWh/a	55	65	110	29	28	40	75	120	
Calculative CO ₂	tn/a	10 000	11 300	19 100	4 300	4 100	4 000	4 900	17 800	
CO ₂ stream concentration (purity) estimate	%	~15%	~15%	~15%	~15%	~15%	~15%	>95%	>95%	