HOW BIOGAS SOLUTIONS CAN MAKE OUR PLANET GREAT AGAIN

HENRIK DAHLSSON & ERIK HANSSON
SCIENCE BASED TARGETS INITIATIVE (SBTI)

• Aligning corporate carbon reduction targets with climate science that recognize the importance of a carbon budget as the starting point

• Scania has committed to a 20 percent decrease of CO2-eq customer operations by 2025 compared to 2015
THREE PILLARS FOR SUSTAINABLE TRANSPORT
THE GREEN TOOLBOX

Energy efficiency
Smarter transport
Renewable fuels and electrification
URGENT CLIMATE REDUCTION NEEDED TO MEET 2030 TARGET

- Climate Law Target: 70% CO₂ reduction from road transport by 2030
- CO₂ reduction 2019: 2% (yellow line)
- CO₂ reduction needed to 2030: 8% annually (green line)
- Three actions:
  - Biofuels
  - Electrification
  - Transport efficiency

Source: Swedish Transport Administration
THE FIVE MAIN DRIVERS OF SUSTAINABLE TRANSPORT

- Congestion
- Pollution
- Energy Security
- Climate Change
- Resource Efficiency
AN URBAN WORLD
MOBILITY DEMAND WILL TRIPLE

70%
POPULATION

86%
GDP

80%
ENERGY USE

80%
CO₂

NEW DEMOGRAPHICS
NO SUSTAINABILITY WITHOUT SOLUTIONS FOR ASIA AND AFRICA
IEA sees that the use of biogas will increase and it will increase mostly outside Europe
FUNCTIONAL DEMANDS IN TENDERS IS KEY
VALUE FOR MONEY? AN EXAMPLE FROM THE UK

- 86 more Euro III-IV diesel buses replaced by clean Euro VI biogas buses in city 2 for a similar investment.
- 10x more CO$_2$ and 4x more PM reduced in City 2!
- Value the taxpayer’s money and prioritise what is best for the people and the planet! Focus on real reductions of both local emissions and CO$_2$
INTEREST OUTSIDE NORTHERN EUROPE

• 18 waste management facilities in Morocco – attempt to use Smart City Sweden.

• Big bus deal in Abidjan looking at 50 biogas buses – partnering with Swedfund.

• Pre-study with the world’s finest BRT system in Bogota.

• Huge potential in Italian market but upgrading is a bottleneck.
INNOVATION - LOCAL EMISSIONS
WITH BIOGAS YOU GO DIRECTLY TO EURO 6

PM (partiklar) (g/kWh) vs. NOx (g/kWh)

- Euro 1 1992
- Euro 2 1996
- Euro 3 2001
- Euro 4 2006
- Euro 5 2009
- Euro 6 2014

GAS

NOx reduction 94 %

Particle reduction 98 %

4 June 2020 Erik Hansson & Henrik Dahlsson / BRC FO7
A CLEAN BIOGAS BUS – THE BEST DEAL FOR SOCIETY

Societal cost benefit for producing and using biogas taking acidification, particle emissions, GHG emissions and overfertilization into account

Societal cost benefit for one biogas bus is 33 000-71 500 EUR/year compared to diesel!
**BIOGAS GENERATES A LOT OF WORK**

• Employment potential for biofuels is 100 times higher than for fossil counterparts. (Renner & McKeown, 2010)

• In EU it is estimated that 275,000 direct jobs and 400,000 will be created by the biogas sector until 2050 (Guidehouse Inc., 2019)

• In Sweden one bus generates one additional full time employee. (KanEnergi, 2012)

• In South Africa the figure can be as much as 2,5 full time employees. (IVL, 2015)

• ALL these jobs are local.
KALMAR – A REGIONAL DEVELOPMENT STRATEGY

https://www.youtube.com/watch?v=_cp1zq2WF0s

KALMAR – A REGION POWERED BY WASTE

130 GWH REGIONAL BIOGAS, POWERING BUSES AND TRUCKS
LOCAL CO-OP CITIES – AUTHORITIES – BIOGAS PRODUCERS – FARMERS
LOCAL ENERGY, JOBS AND PROFITS FOR THE REGION
BIOMETHANE IN SWEDEN

• Number of vehicles 2019:
  – Total: 54 000 approx; Buses: 2 600; Trucks: 1 000; Personal cars and vans: 50 400

• Bus procurement:
  – Driving market development of biomethane historically (use 50% of produced biogas)

• More initiatives in truck market:
  – Dairy producer Arla: Production of biogas at 80 farm, set target 30% of fleet on biomethane
  – Food industry, as well as waste and recycling industry leads development
GAS INFRASTRUCTURE AND BIOMETHANE IN SWEDEN

• Filling stations for CNG/CBG:
  - 190 public, 60 non-public.

• Filling stations for LNG/LBG:
  - 18 public, about 10 more stations in 1-2 years.

• High percentage of biomethane:
  - 94% in CNG vehicle gas mix, 100% possible.
  - 50% in LNG vehicle gas mix, 100% possible.

Source: Energigas Sverige/Swedish Gas Association
GAS ENGINES – NOTHING NEW...?

1920 Sweden - about 5-8 m³ at atmospheric pressure, similar to 5-8 litres of petrol.
SCANIA EURO 6 GAS ENGINES
THE MOST ENERGY EFFICIENT WAY TO USE YOUR GAS

Otto engine with outstanding efficiency
40% thermal peak efficiency
Diesel torque levels

Scania modular system – Scania quality
Less than 40 parts differ from diesel engine
Excellent service and spare part availability

All types of applications
280 hp (Bus, Truck, 1350 Nm)
320 hp (Bus, 1500 Nm)
340 hp (Truck, 1600 Nm)
410 hp (Truck, 2000 Nm)
Range 1 100-1 600 km

Other features
Less sensitive to gas quality
100% operability on 2 000 m+
Both CNG/CBG and LNG/LBG ganks
No complex after-treatment/SCR/AdBlue necessary
Only 3-way catalyst necessary to reach Euro 6
Up to 90% CO₂ cuts with biogas (~10-20% with CNG)
Quiet – half the noise of a diesel engine.
LEARNINGS FROM SWEDEN

- Local decision makers leading the way – biogas as a regional development strategy
- Goals and political commitment – over time
- Government commission on biogas:
  - Production target 2030: From 2 TWh to 10 TWh
  - Support for production, distribution and use
- Pre notification to EU Commission:
  - Tax exemption to 2030
OPPORTUNITIES

Europe
• The infrastructure is there – use it!
• In many places there is a huge amount of waste costing money. Turn it into energy!
• Challenge – develop synergies and joint strategies to meet Corona crisis and climate challenge through EU Green Deal.

Globally
• Cheap, clean technology and more reliable than developing countries electric grid.
• Will the post-corona economy lead to increased focus on local economy, energy and jobs?
• Could be the next big Swedish export – we need a “Biogas Sweden AB” for joint export ventures.
THANK YOU FOR YOUR ATTENTION

HENRIK.DAHLSSON@SCANIA.COM
ERIK.HANSSON@SCANIA.COM