

Phasing out fossil fuels in Swedish public transport bus fleet

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västtrafik

Public Transport Authority of West Sweden

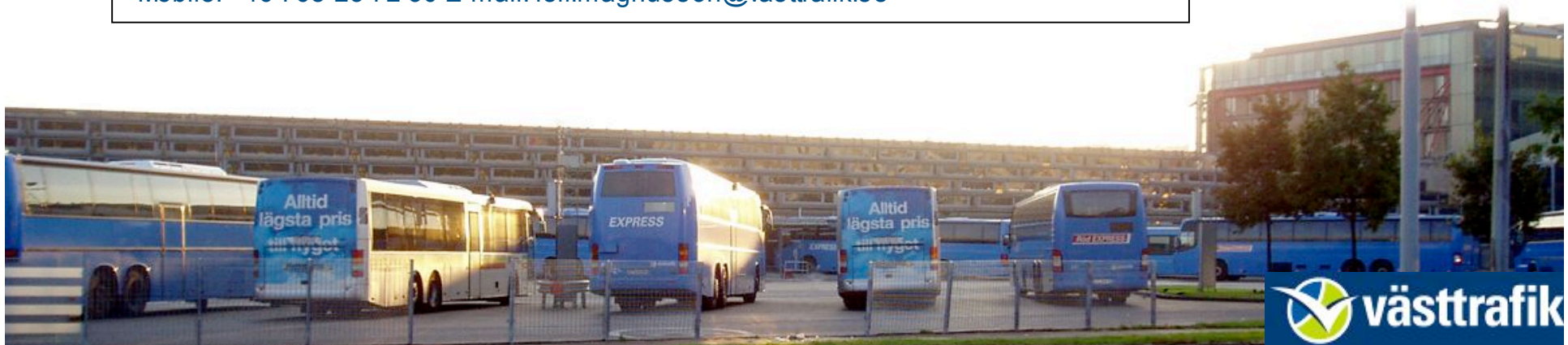
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West Sweden

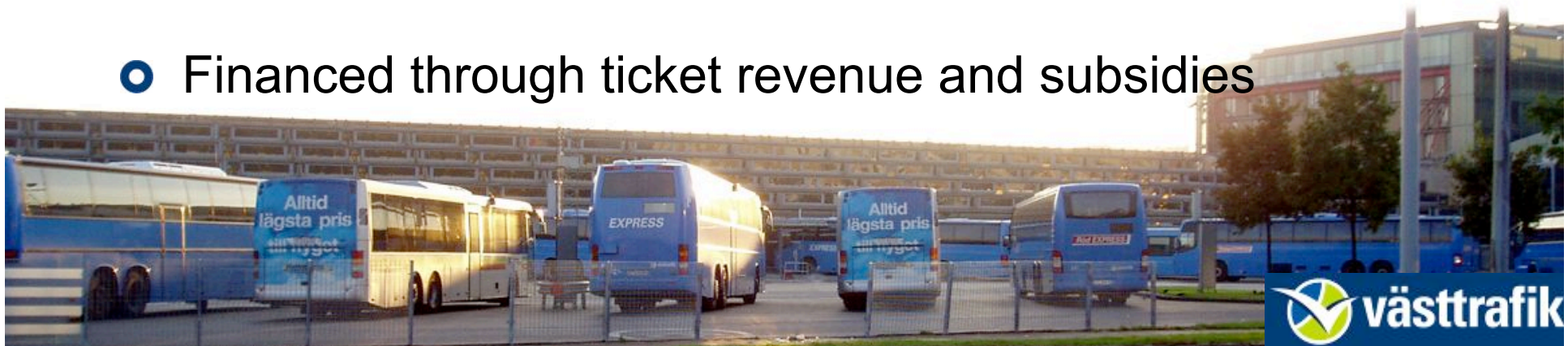
- 1.5 million people
- 24 000 km²
- 500 000 people in the Gothenburg area



Västtrafik

Public Transport Authority of West Sweden

- Sweden's second-largest public transport authority, formed as a registered company
- Owned by the Region and the municipalities and cities of West Sweden
- Coordinating all public transport services in the region, cities and rural areas
- Procuring the transportation services
- Financed through ticket revenue and subsidies





Vehicles

Buses \approx 1500

Special vehicles
(cars, taxis, minibuses) \approx 700

Trams \approx 230

Trains \approx 60

Passenger ships \approx 30

All vehicles except for trains, owned by operators

Public Transport Bus in Sweden

Environmental history

- 1980's – bus fleets on bio gas and bio ethanol
- 1990 Sulphur free fuel, Low aromatic
 - tax differentiation
- 1995 – retro fit particulate filters
- 2001 – reduction of NO_x
- 2006 – more focus on global warming – renewable fuels
- 2009 – more focus on energy use



How to achieve future targets?

Society

Decreased emission of climate gases

Decreased dependence on fossil fuels

Public Transport Industry

Our market share shall grow

Offer transports with good environmental performance

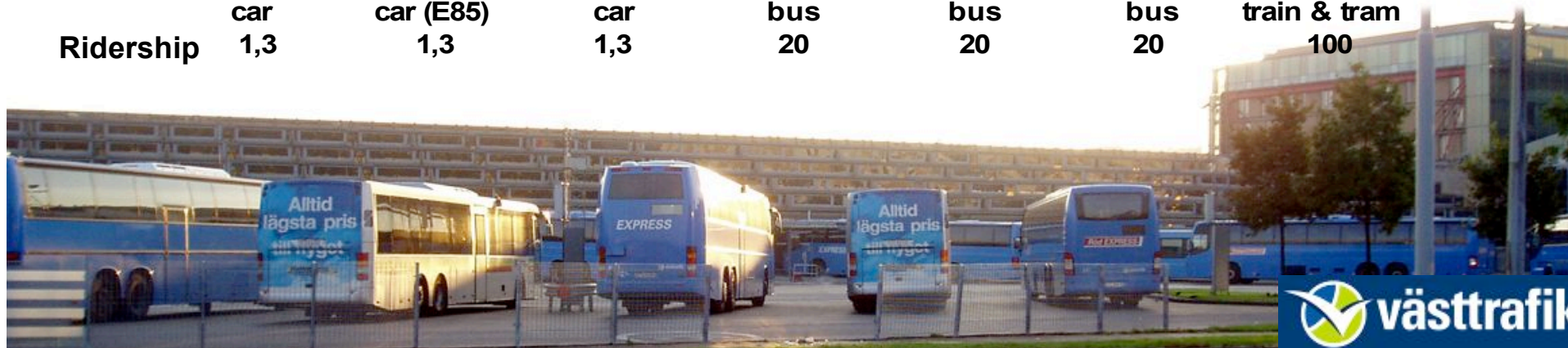
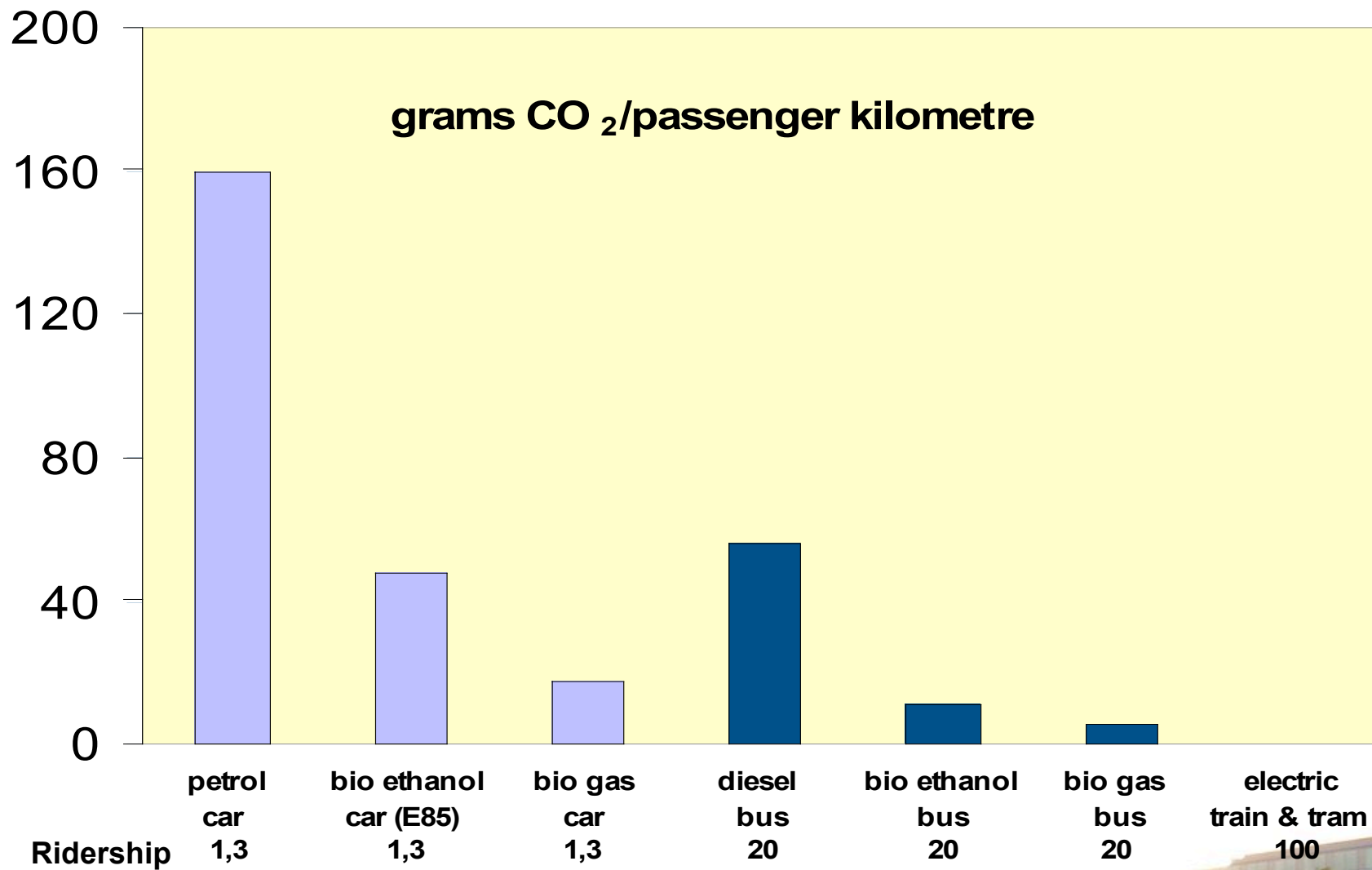
Public transport as a part of the solution

- Car → public transport
 - Attractive Public Transport

Public transport as a part of the problem

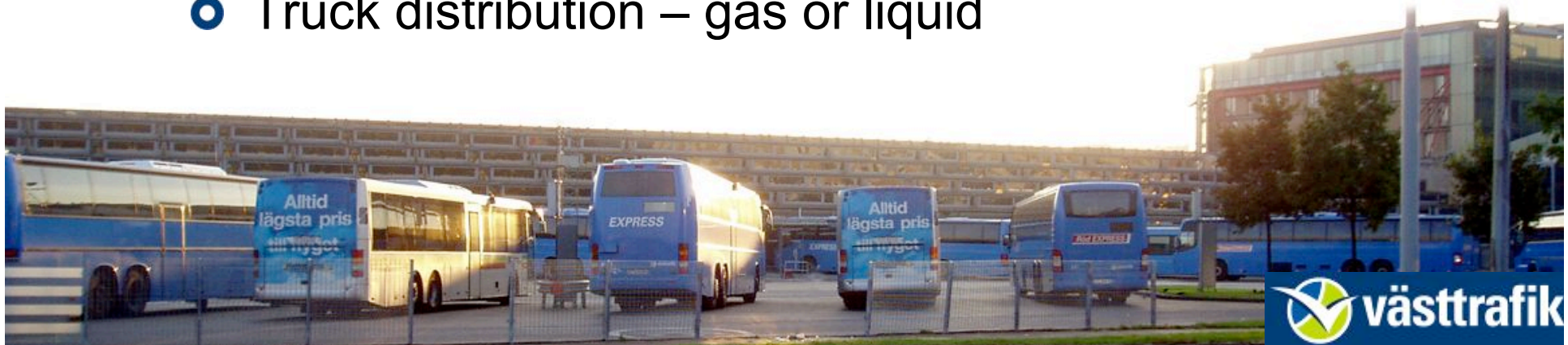
- Increased rider shares
- Lower fuel consumption
- Introduction of renewable fuels
- Low emissions & noise
- Etc.





Bio methane in Sweden

- 4 suppliers of gas buses
 - City buses 12 m
 - Articulated city buses
 - Regional buses
- 16 suppliers of bio methane
- Filling stations
 - Close to production through pipe
 - Distributed through natural gas pipe in south and west Sweden
 - Truck distribution – gas or liquid



Bio methane

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- Production from waste may give improved effect – other environmental impact reduced
- Good traceability – cultivation methods, life cycle impact, social values
- High reduction of life cycle CO₂ (»90 %)
- Partnership with fuel supplier
 - may grant long term agreements for fuel supply and stable prices
 - fuel supplier can secure sales



Bio methane

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- Presently 25 – 40 % higher energy use compared to diesel technology
- High investment costs » 35 000 € – 12 m city bus (compared to diesel)
- High maintenance costs – but varying with operator and manufacturer. Presently calculated » 0,1 €/km compared to diesel
- Takes more active and engaged maintenance work on vehicles



Summary

- Targets:
 - Reduce energy use
 - Reduce CO2-emission
- Develop public transport to reduce the need for car transportation
- Better utilisation
 - City and transport planning
 - Higher rider share
- Renewable fuels – Presently Bio gas, Bio Ethanol, Bio Diesel
- Biogas: partnership
 - Secure supply of fuels for the future
 - Long-term contracts for predictable prices

