VOLVO's

ENVIRONMENTAL STRATEGY FOR NEXT GENERATION TRUCKS

CECILIA GUNNARSSON
Feature Specialist Environment
Volvo Truck Corporation

1972

Volvo does not intend to protect motor vehicles at any price and in all connections.

However, the motor vehicle is indispensable today as a transport unit. It is in the interest of Volvo that motor vehicles are used in such a way that they do not cause damage or injury.

Volvo now considers its responsibility to be not only to ensure that the products are practical as transport units but also that they function in the widest perspective - in our environment.

Volvo alone cannot solve the environmental problems associated with motor vehicles. The community carries the main responsibility for developing our transport systems. But Volvo is determined to make active contributions with viewpoints and proposed solutions.

Volvo is convinced that a city environment which is both vital and favourable to human beings can be combined with efficient transport resources. The community needs both.

Volvo considers that neither fantastic Utopian products nor a romantic back-to-nature movement will solve the problems of the community but believes instead in practical and simple solutions which can be discussed and understood by everyone.

Core Values

Quality	Safety	Environment
		

Quality, Safety, and Environmental care express the Volvo Group's ambition to **create value for our customers** and to **contribute to sustainable development** as an **active partner with society**

Environmental Challenges

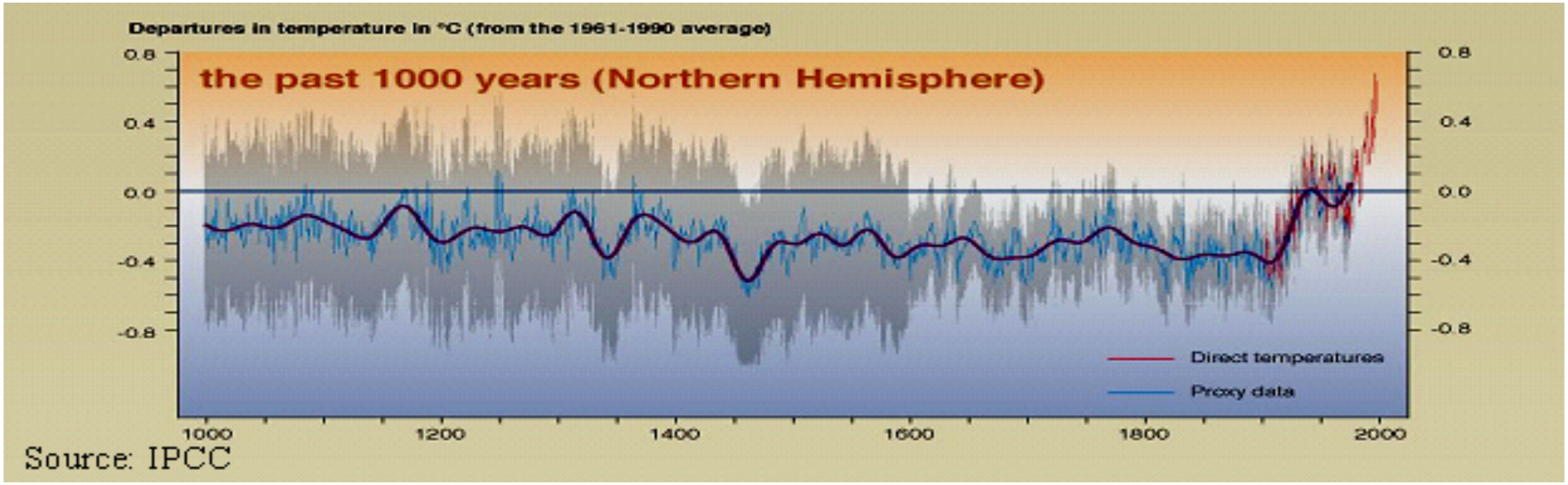
- Energy
- Greenhouse effect
- Air quality
- Noise

Climate Change

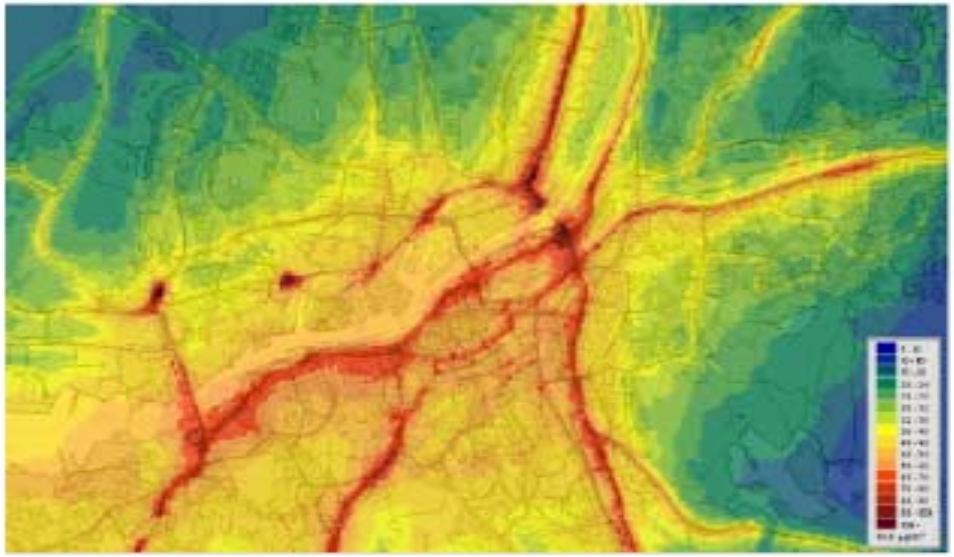
- **"Climate issues will present the automotive industry with its greatest challenge in the future"**

  Leif Johansson President and CEO of AB Volvo.

- The needed reduction of fossil greenhouse gas emissions will be a very strong driver for low or CO_2 neutral fuels and vehicles.



Air Quality

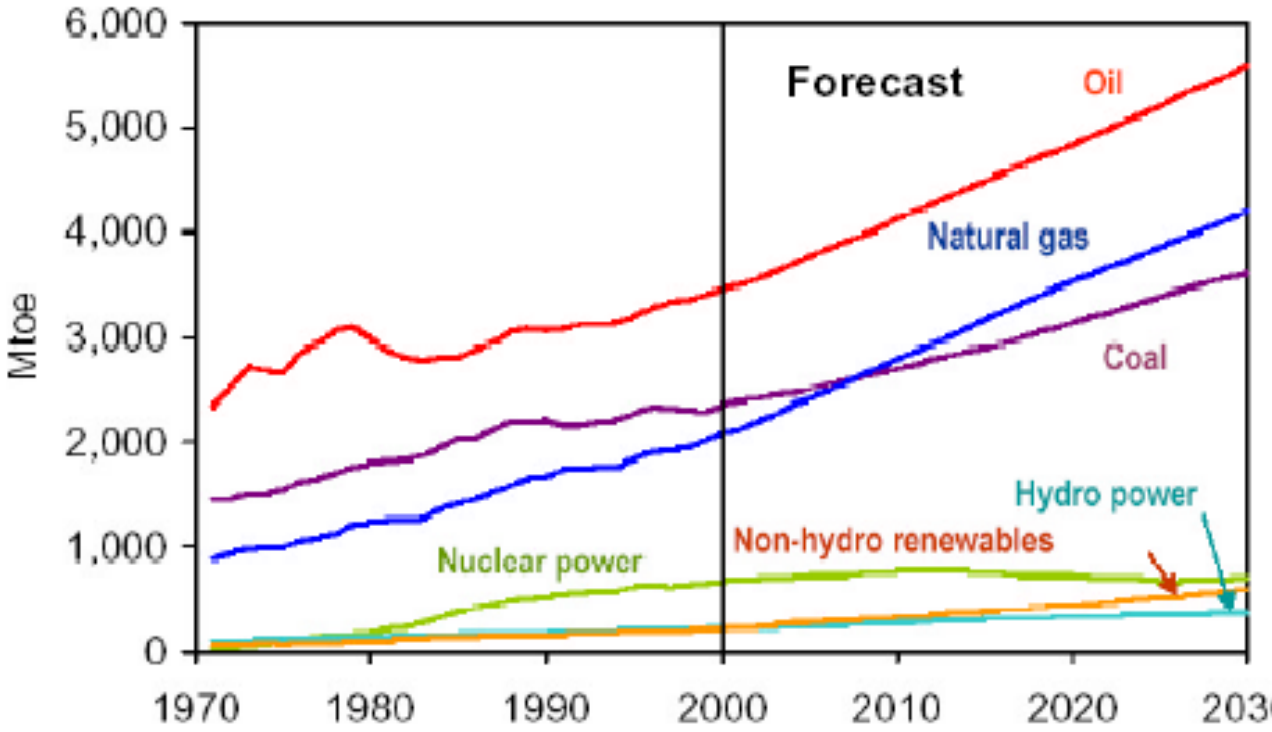


NO_2 in Gothenburg, Sweden 2000

- NOx and PM content in air
- Measurements show road traffic as main sources

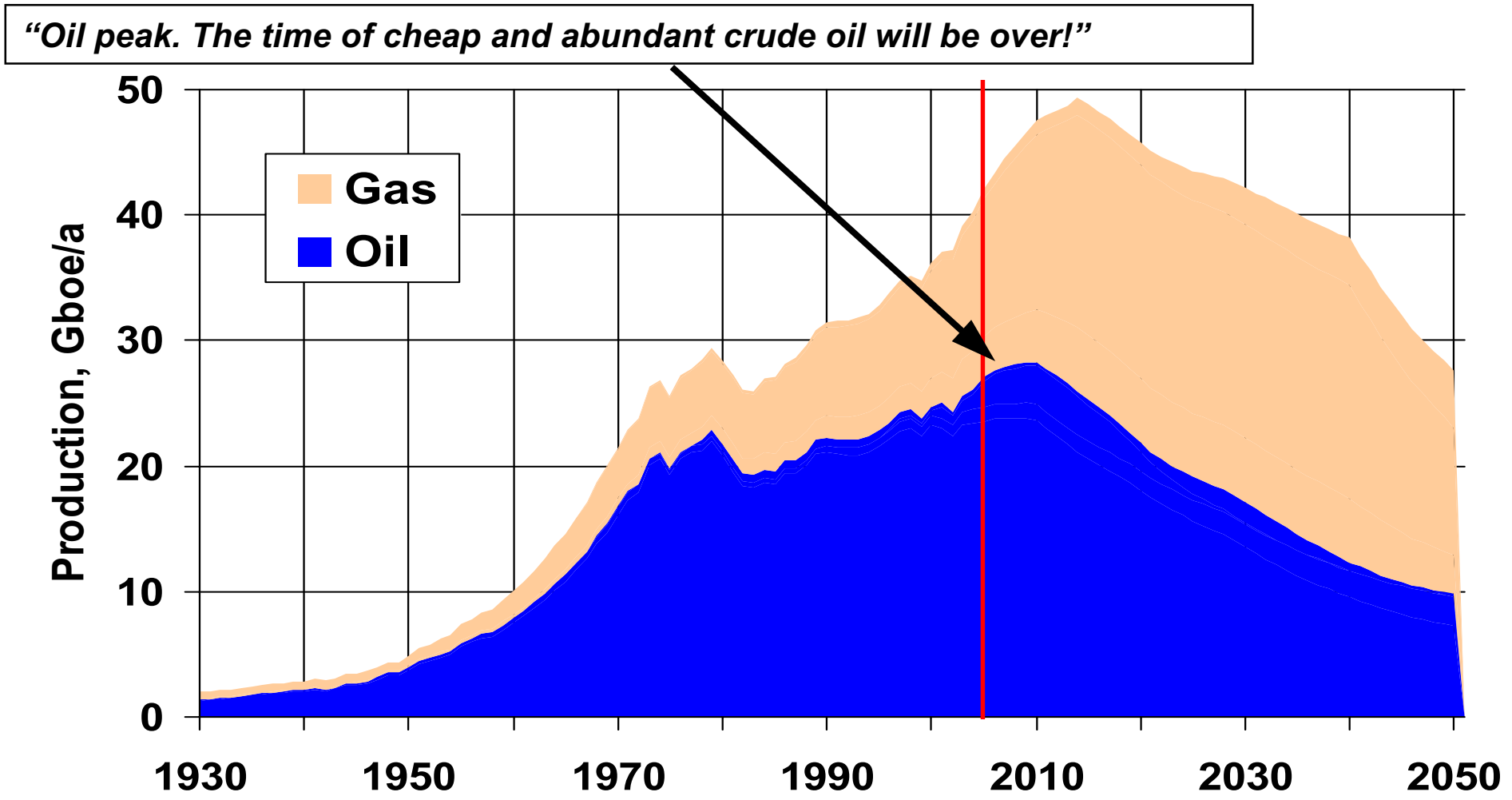
Increasing energy demand

- The world energy demand will grow approximately 2.0% per year
- The transport sector even faster, approximately 2.5% per year



Source: World Energy Outlook 2000, IEA

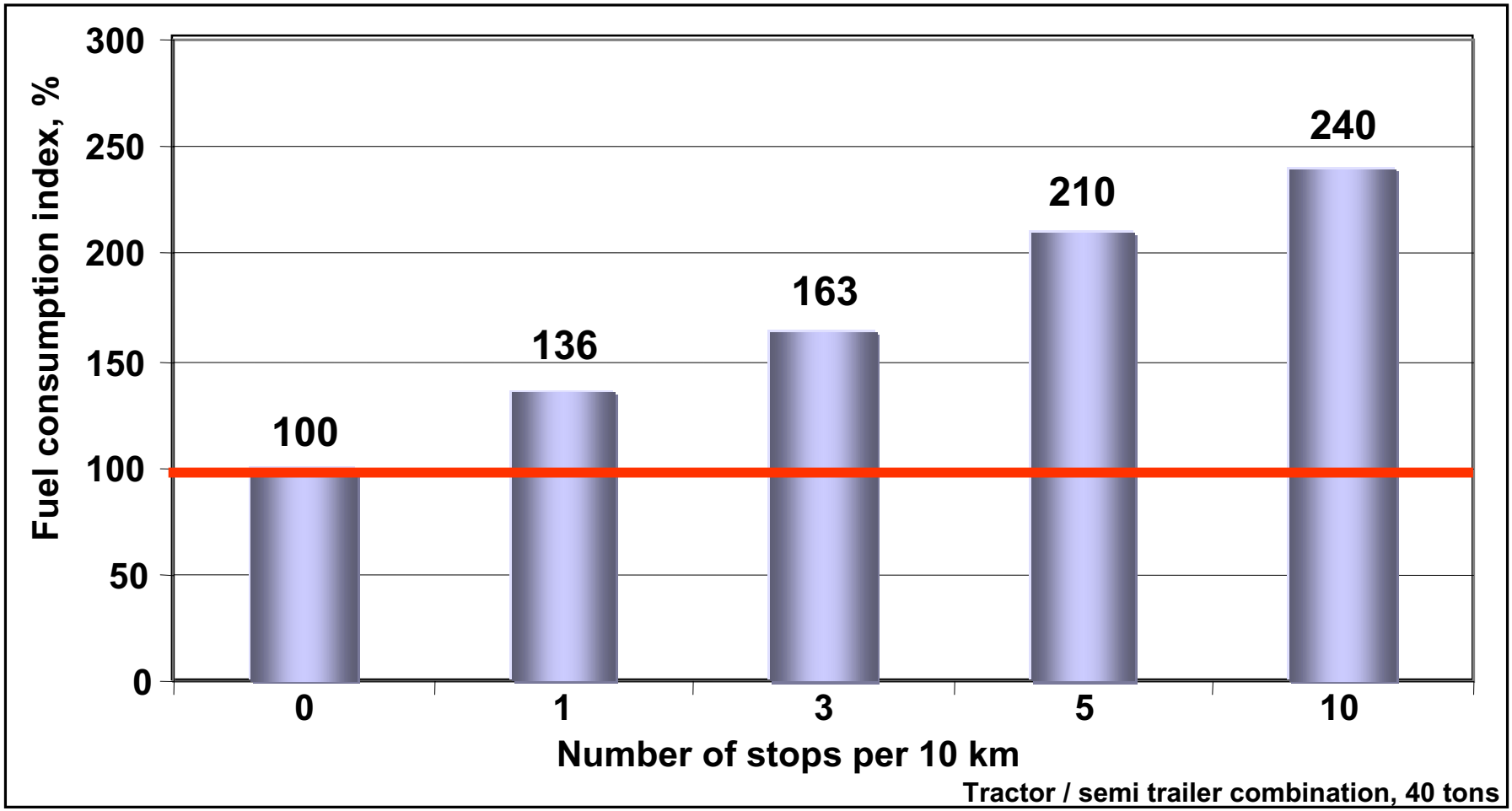
Production of all Oil and Gas



Source: CJ Campbell, 2004

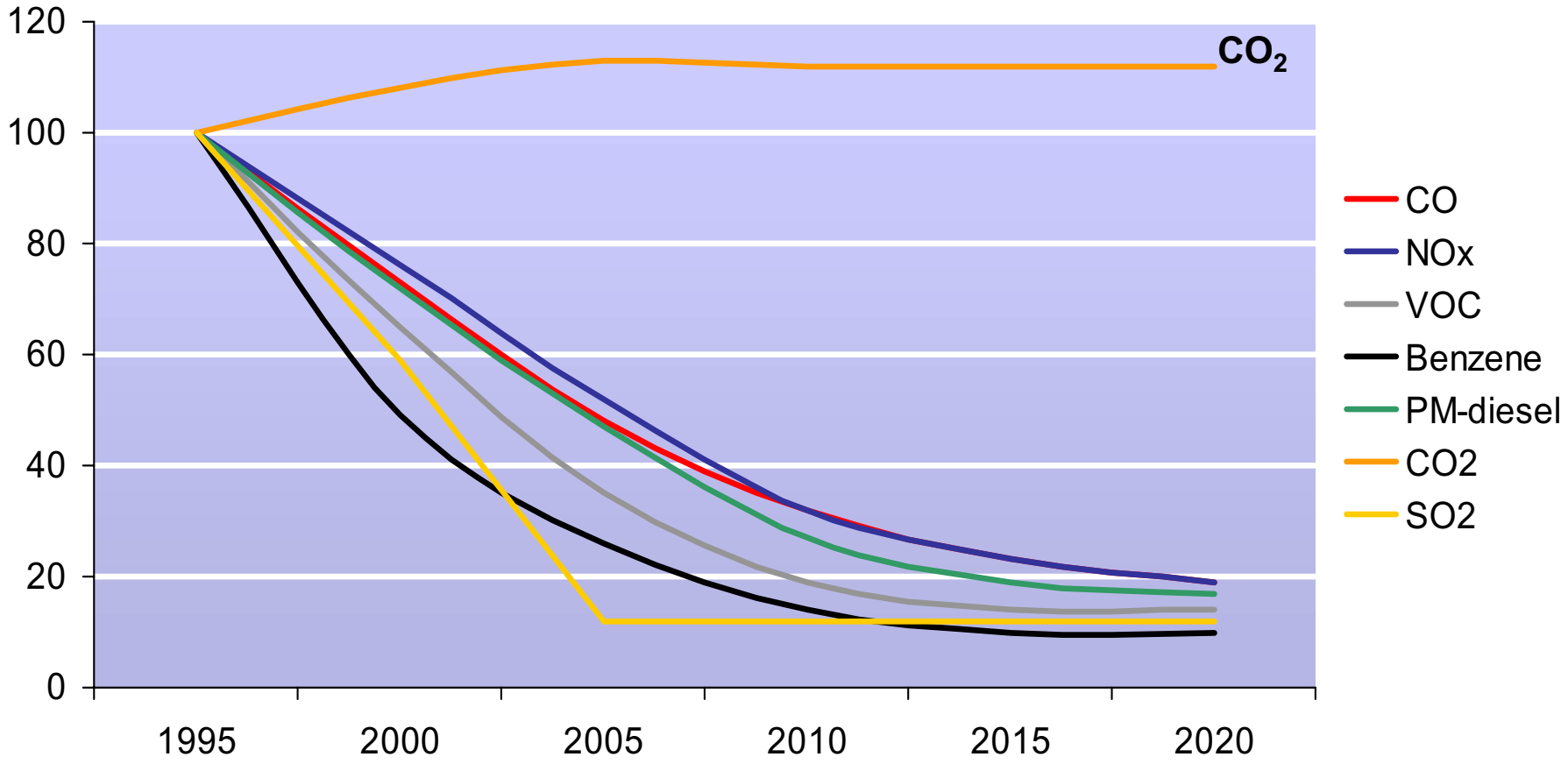
Infrastructure Impact on Fuel Consumption

..impact on the number of stops



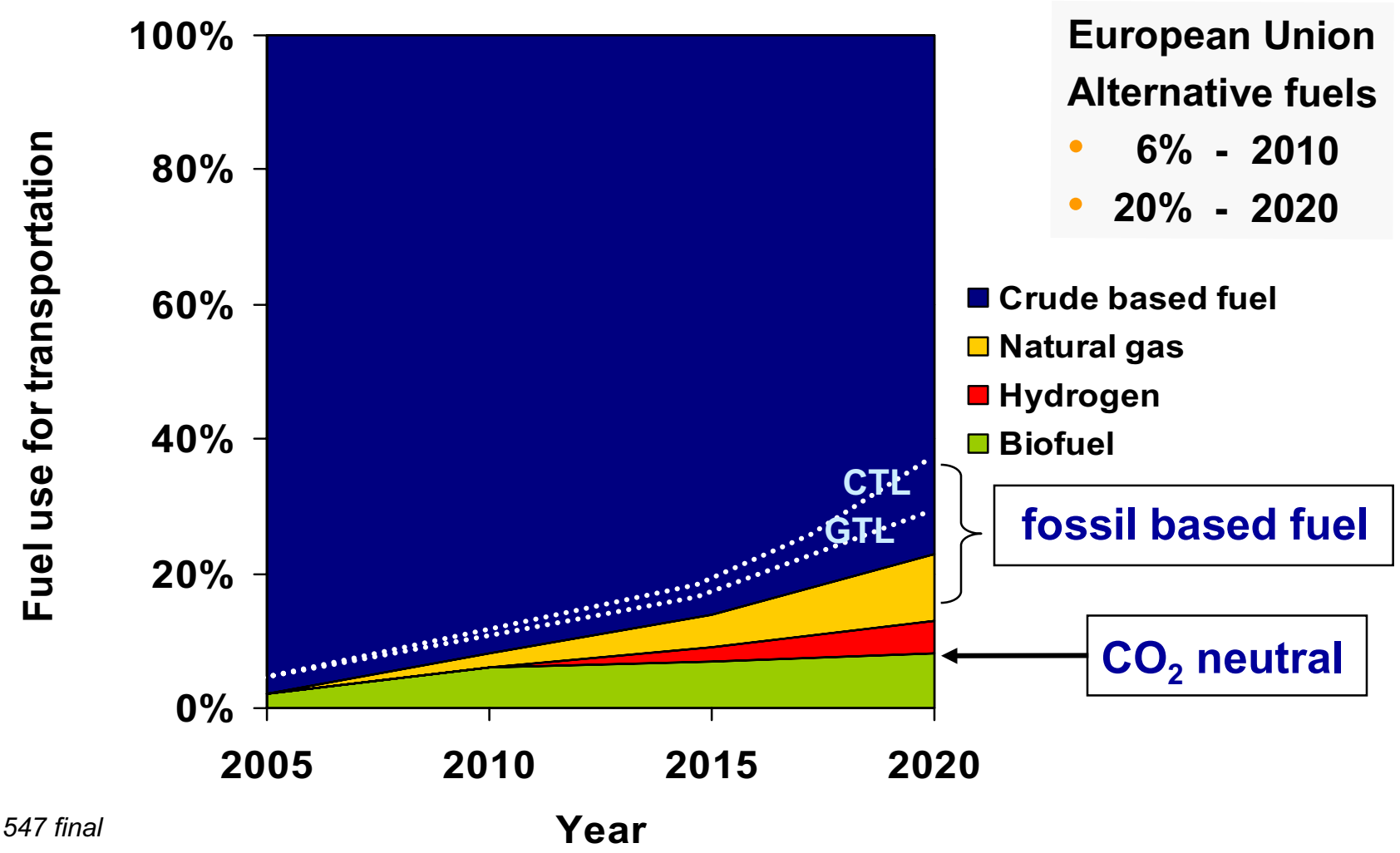
Road transport emission development

All gaseous emission components will soon reach “sustainable” levels except CO_2 … our future challenge!



Future Fuel Sources, Outlook

Renewable fuels are not "Alternative" rather "Complementary"



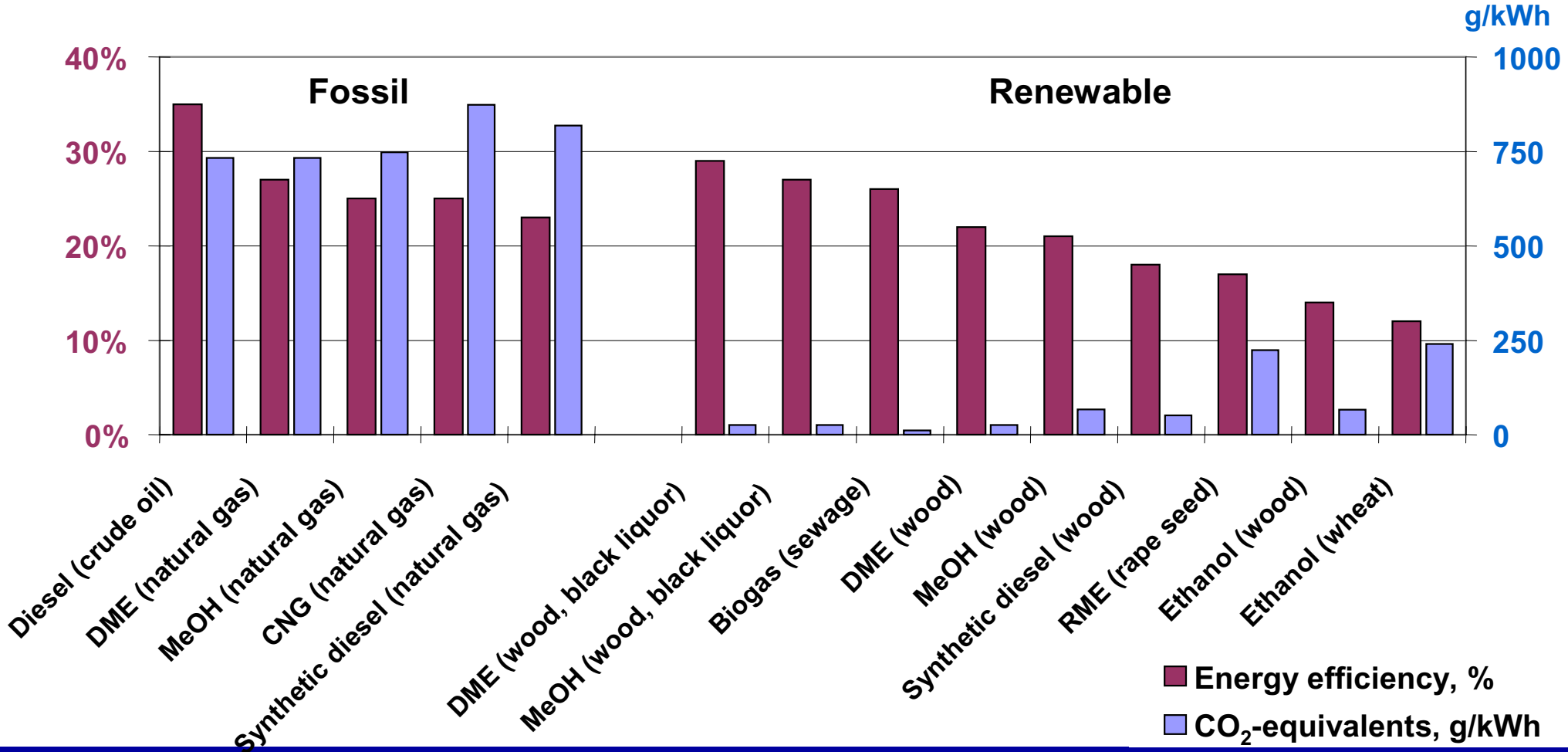
Source: COM(2001) 547 final

Scenario conclusions

- Climate change must be addressed
  - Well-to-wheel CO_2 emissions
- Current use of oil is not sustainable in the long run
  - Availability
  - Security
  - Oil price
- Energy efficiency must be focused, regardless if the energy is finite or renewable
  - Well-to-wheel energy efficiency

”Well-to-wheel” analysis

Volvo study

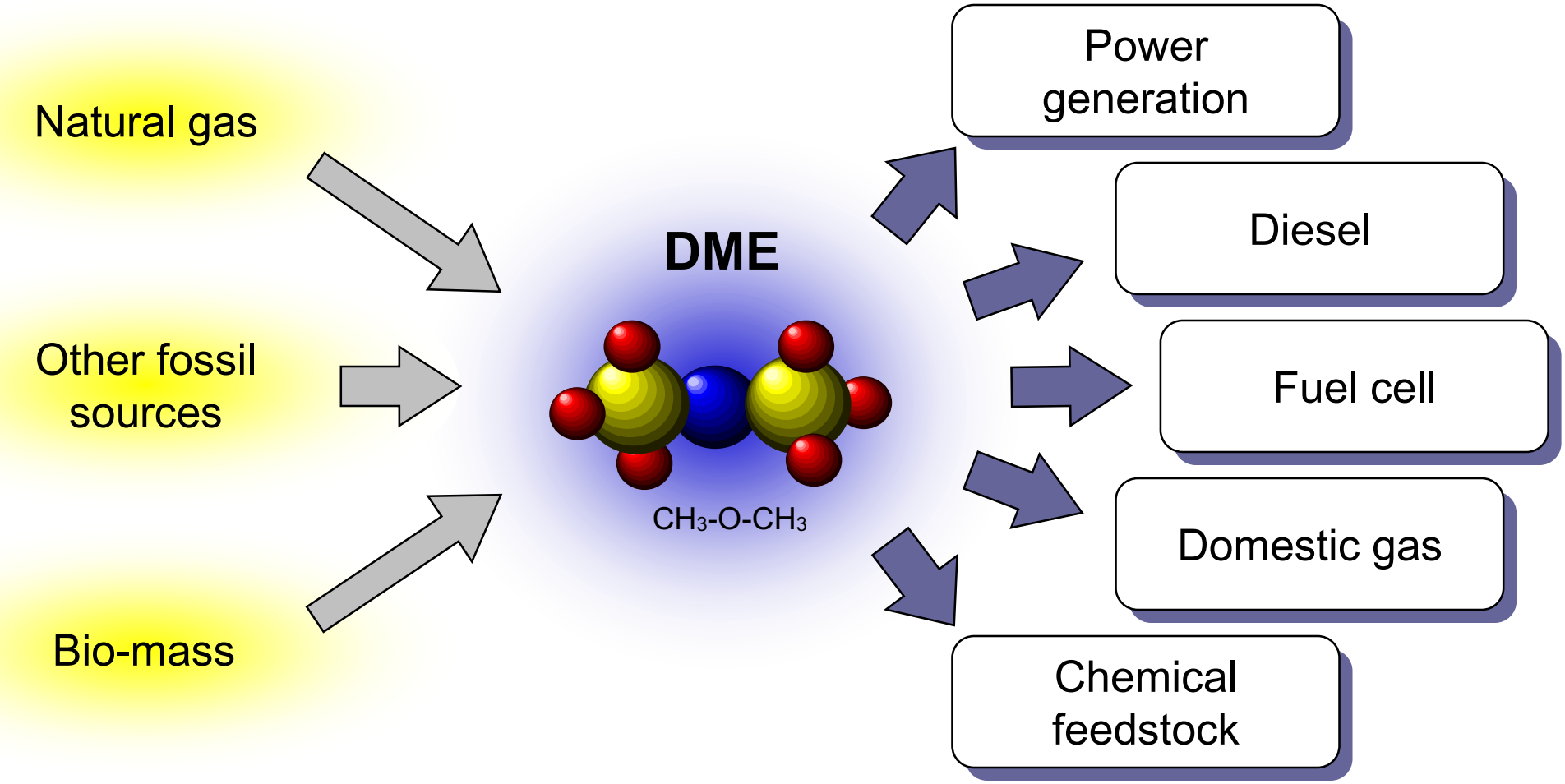


Future fuel scenario

- The increasing gap between production of light crude and market growth can only partly be compensated by Bio-fuel.
- Synthetic fuel production based on other fossil hydrocarbon will have to increase, thicker unconventional oil, GTL and CTL. However, this will have a continuous worsening effect on the global CO_2 issue.
- Best Well-to-Wheel efficiency obtained through the DME route.
- The use of DME eliminates the PM issue.
- Synthetic diesel will not need new infrastructure, engines and onboard high pressure tank system.
- Regionally natural gas will increase in importance as a logistic fuel.
- ***Diesel pump price will continue to escalate.***

DME - Dimethylether

A multi source and multi purpose fuel



Volvo's Position on Future Fuels

- **Conventional diesel fuel will remain the dominant fuel for at least two decades.**
- **Natural gas and biogas will be used regionally.**
- **DME is a strong candidate for a more long term future fuel:**
  - Best well-to-wheel energy efficiency from bio source.
  - Close to CO_2 neutral if produced from biomass.
- **Implementation will require joint forces**
  - Political system
  - Energy sector
  - Vehicle producers
  - Vehicle customers
- **Transforming an energy system comprising vehicles, fuel and infrastructure takes a long time**
  - Requires extensive resources from everyone involved

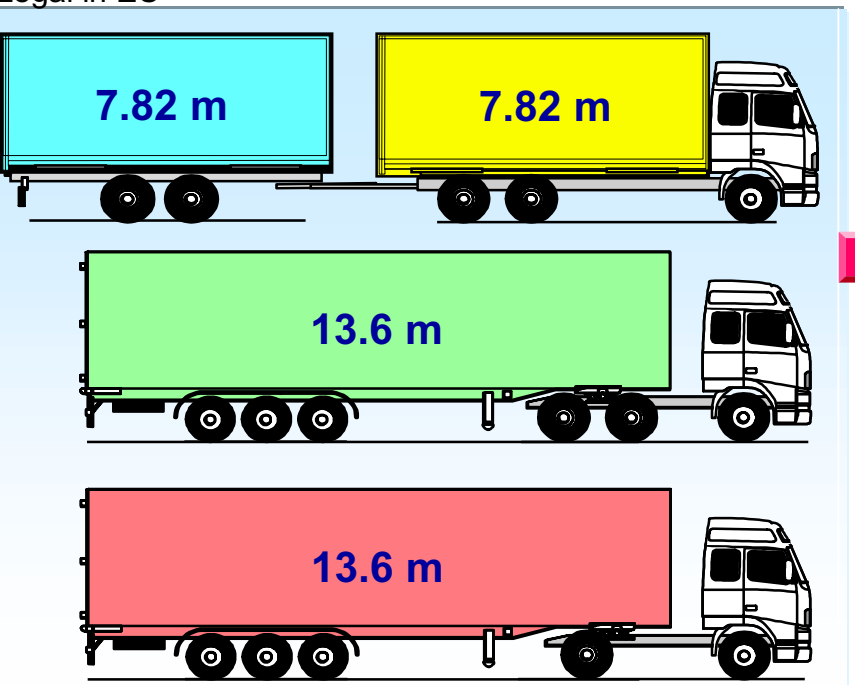
Transport Efficiency

- More efficient transportation with lower environmental impact
- Make it possible to improve utilization of existing transport capacity by up to 10%
- More cargo can be moved with fewer trucks
- Fuel consumption and exhaust emissions are both cut
- Offers detailed information about how much fuel the truck uses

Bigger Combinations in Long Haul

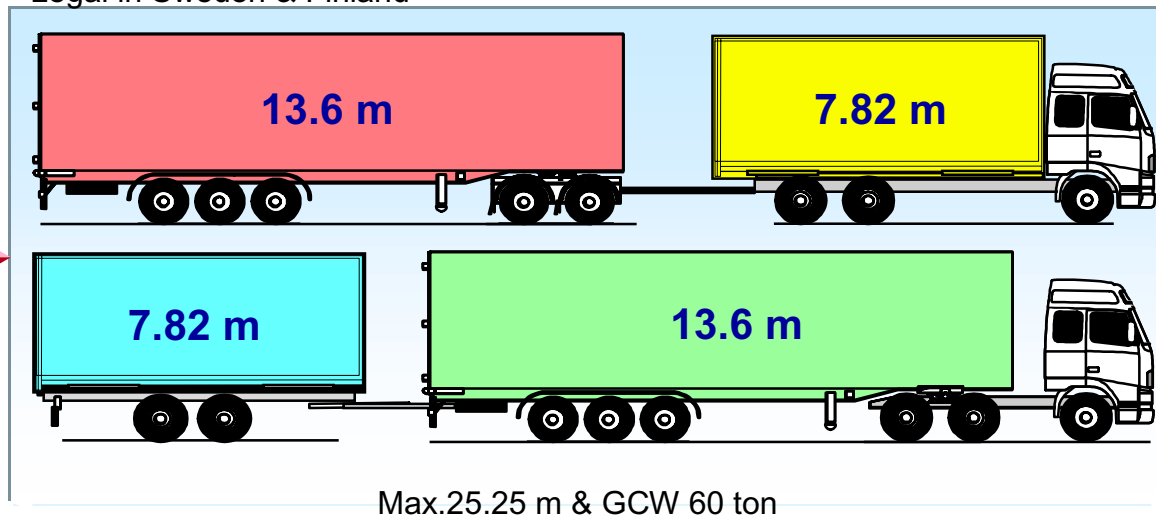
… Euro Module System improves productivity

Legal in EU



Max.18.75 m & GCW 44 ton

Legal in Sweden & Finland



Max.25.25 m & GCW 60 ton

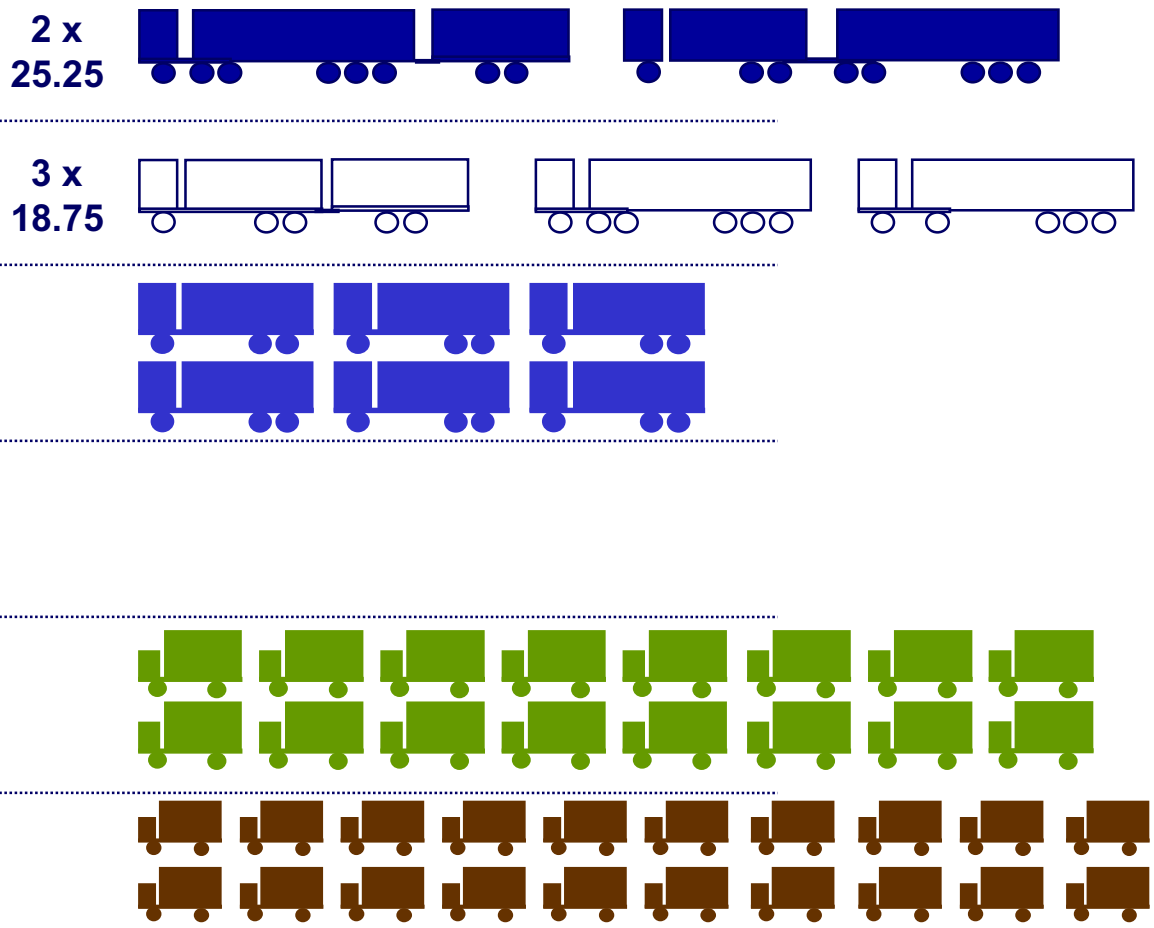
Two vehicles instead of three

- Possible to recouple to shorter combinations
- Standard load units (7.82m and 13.6m)
- Less total fuel consumption (15%)
- Less emissions per tonkm
- Less total room on road
- Lower cost per tonkm
- Less road damage

Comparison 25.25 M Vehicles to Other Sizes

Capacity needed for the transport of 106 pallets

No. of trucks	Space on road	Fuel per 1000tonkm*	Fuel Index	GCW
2	130 m	16 lit	84	60 ton
3	172 m	19 lit	100	40 ton
6	300 m	27 lit	142	26 ton
9	432 m	37 lit	195	18 ton
16	755 m	53 lit	279	12 ton
20	903 m	78 lit	410	7.5 ton



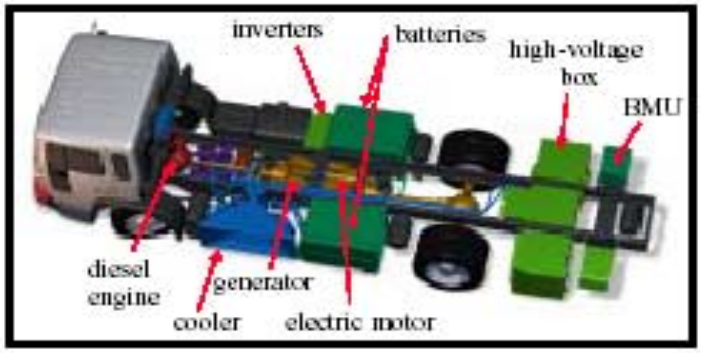
* Note: Calculated with consideration to "normal" utilization

Environmental Concept Truck

Environmental Concept Truck

Gas Turbine S-HEV
110 kW Gas Turbine
NiMH Batteries

The HILDUR



- Demonstration of diesel serial hybrid city distributor.
- >200 kW peak traction power.
- 110 kW diesel generator.
- 43 kWh NiCd batteries giving 15 - 20 km range in pure electric mode.
- Large potential for reduction of fuel consumption when used as "plug-in hybrid".
- Decreased payload due to heavy batteries.

Partners and suppliers:

- ABB
- Vehiculum

Distribution Concept Vehicle

Fewer vehicles and safer urban traffic!

Should be able to replace today's conventional distribution trucks, vans and courier vehicles. A development that would cut the number of urban distribution vehicles by about 30 percent

Improved productivity influences energy consumption for the distribution of each package, and coordination of distribution helps reduce the number of vehicles on the road. This in turn has a positive effect on total exhaust emissions.