

**VOLVO**

**Powertrain**

**on**

**Alternative fuels for heavy duty commercial vehicles**

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Volvo Powertrain Corporation

## Business Areas

### Mack Trucks



### Renault Trucks



### Volvo Trucks



### Volvo Buses



### Trucks



### Volvo Construction Equipment



### Volvo Penta

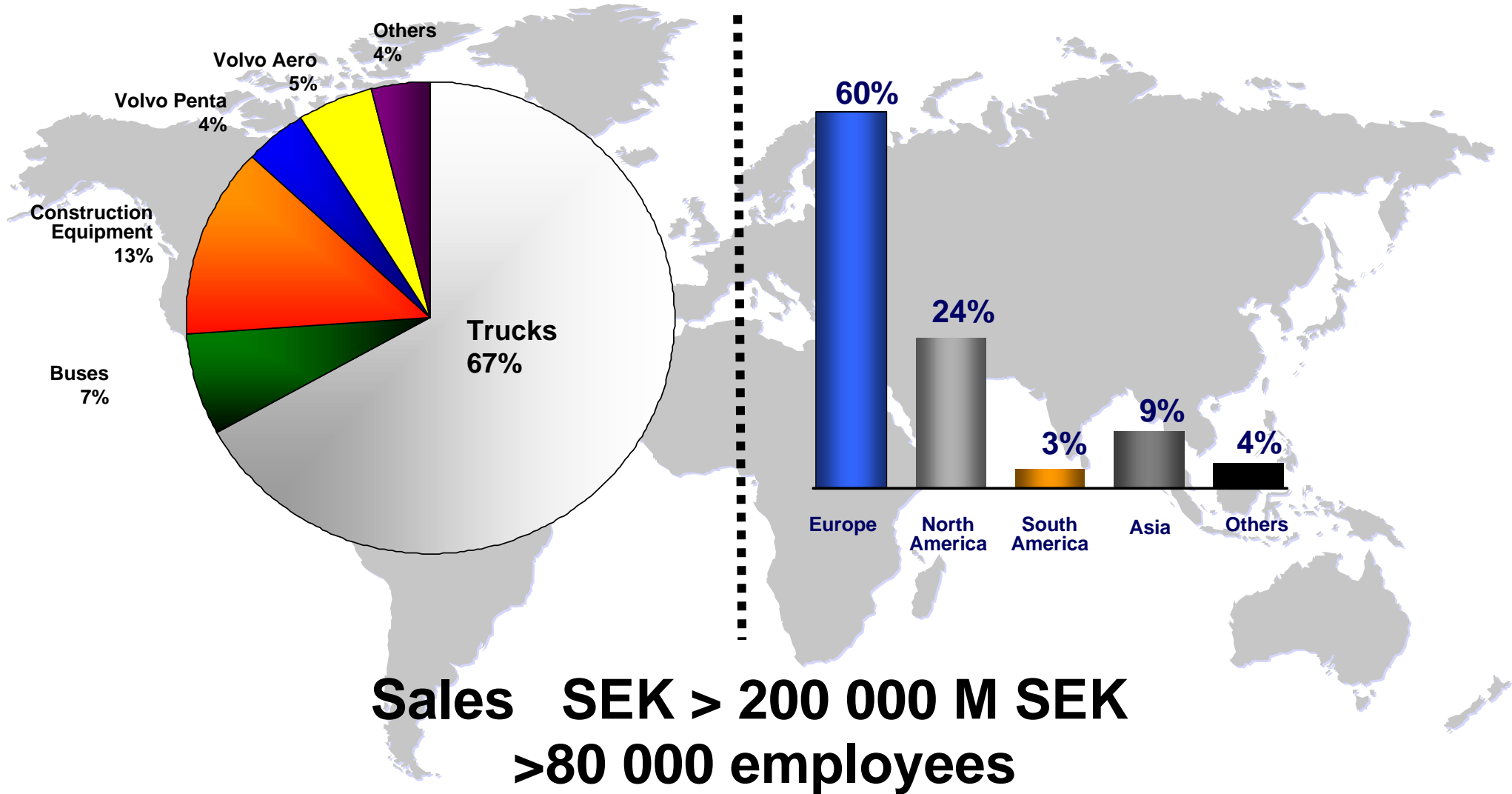


### Volvo Aero



### Volvo Financial Services

# Sales per Business Area and Market Area



# Volvo Group Core Values



Quality

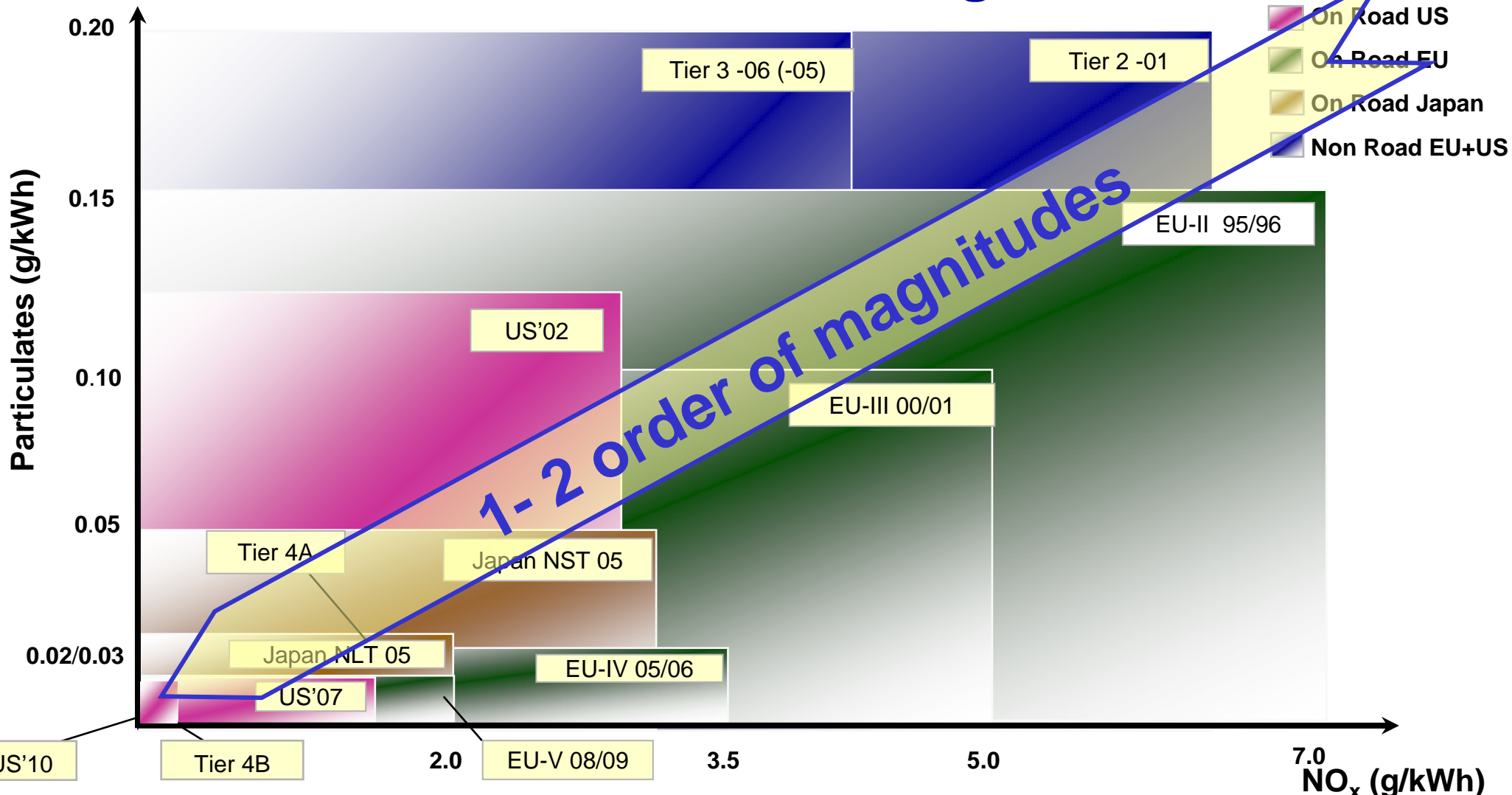


Safety

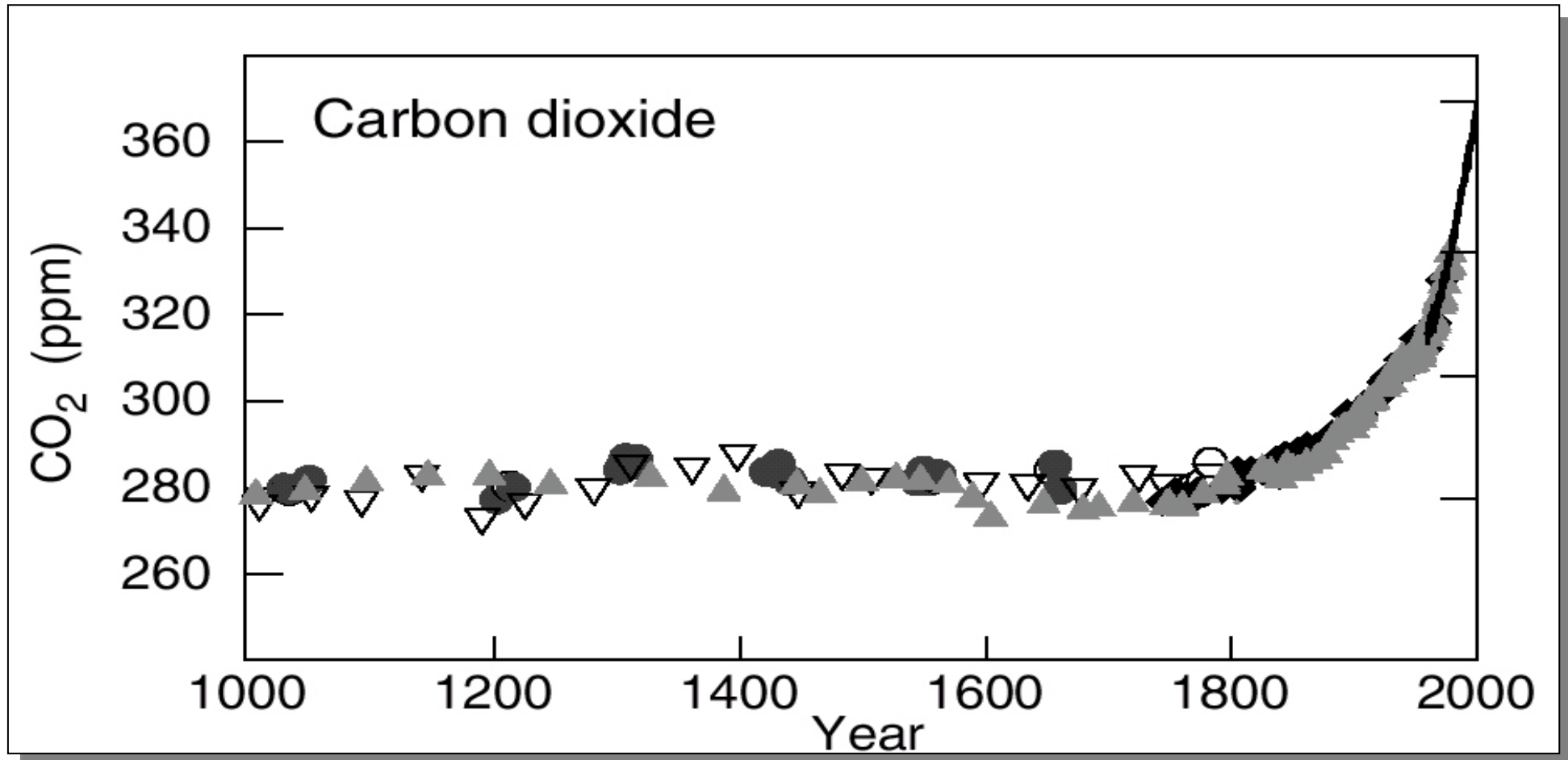


Environment

# Exhaust Emission Regulations



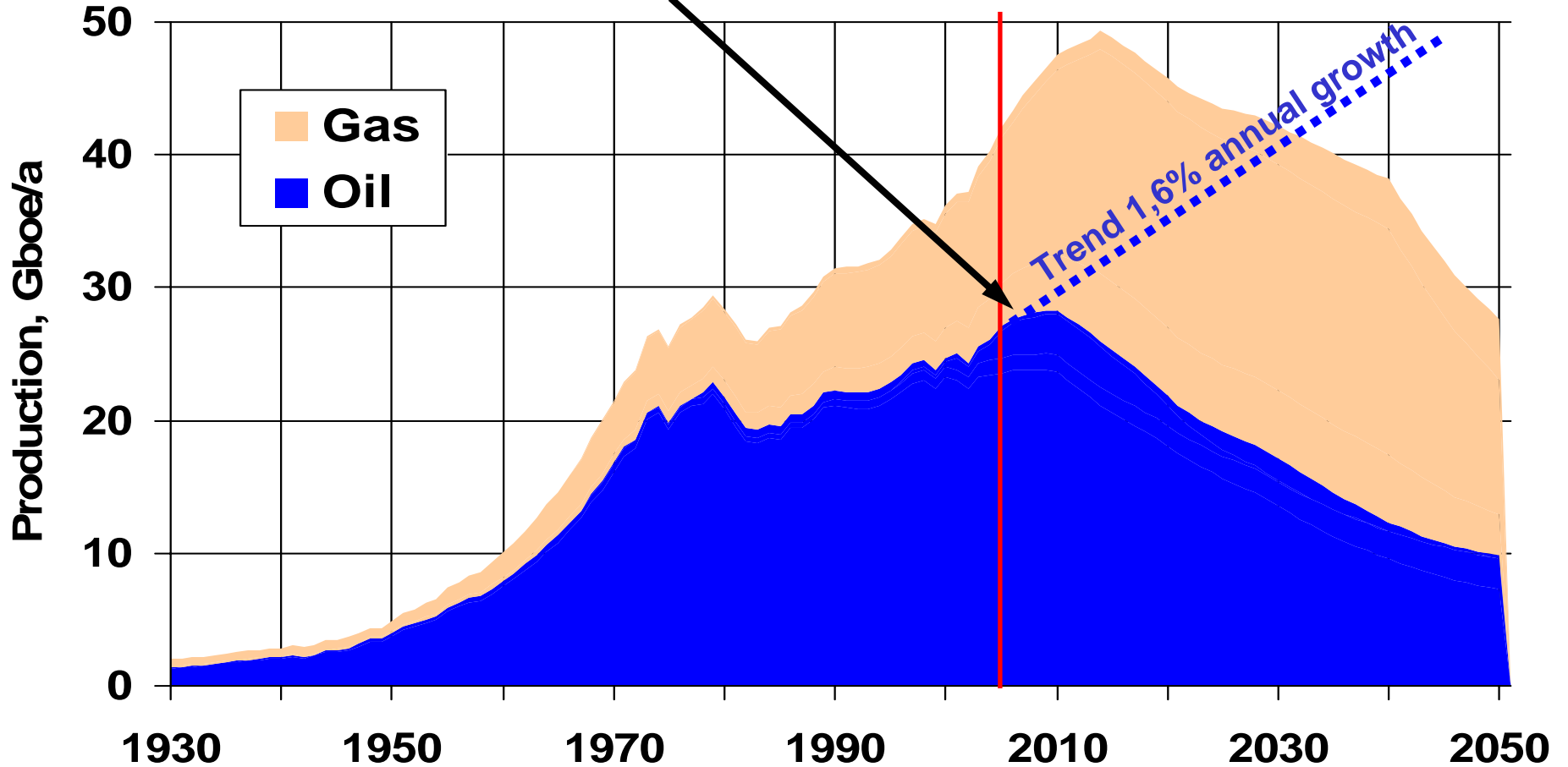
## Atmospheric CO<sub>2</sub> concentrations



Source: <http://www.ipcc.ch/pub/spm22-01.pdf>  
IPCC - Intergovernmental Panel on Climate Change

# Production of all Oil and Gas

*“Oil peak. The time of cheap and abundant crude oil will be over!”*



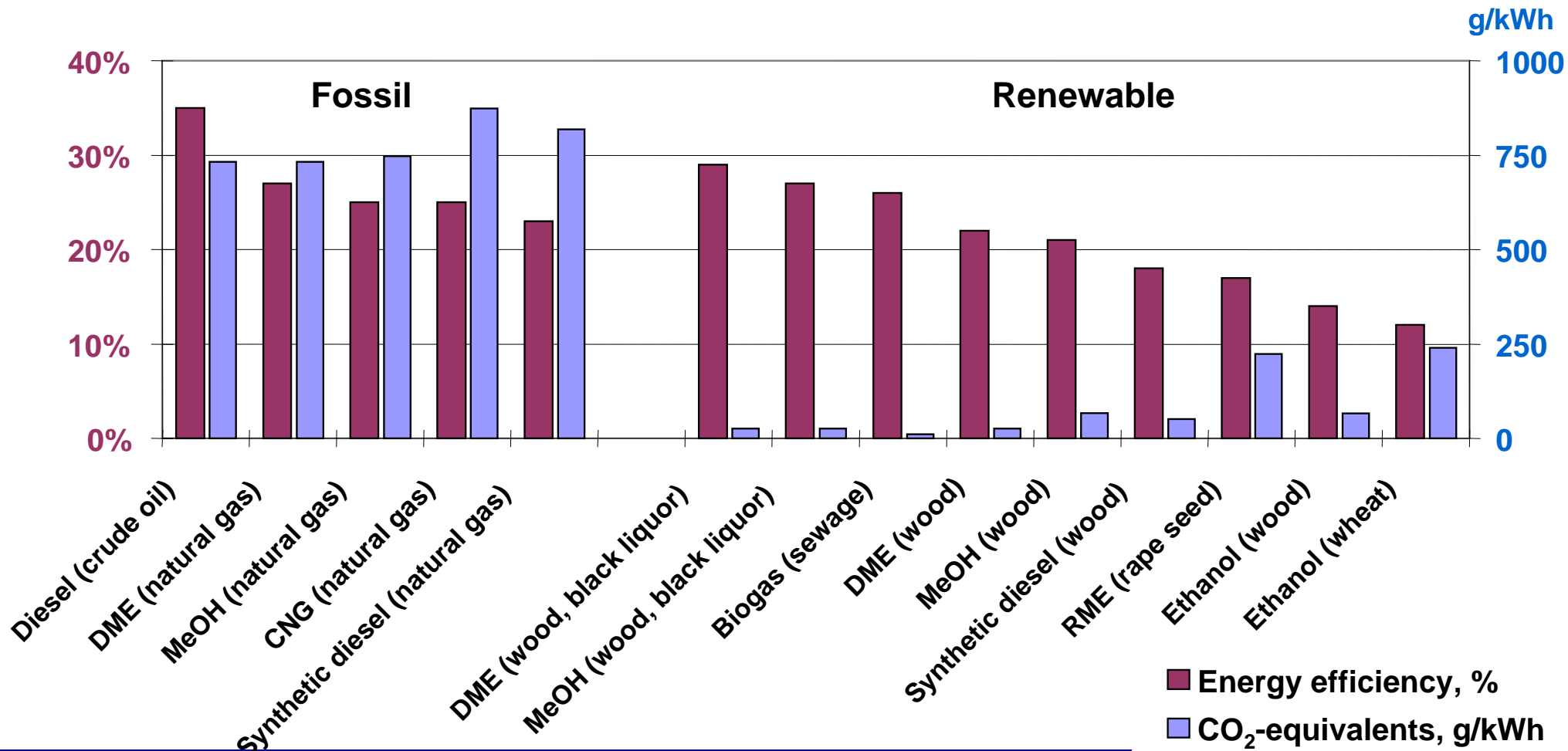
Source: CJ Campbell, 2004

## Scenario conclusions

- Climate change must be addressed
  - Well-to-wheel CO<sub>2</sub> 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

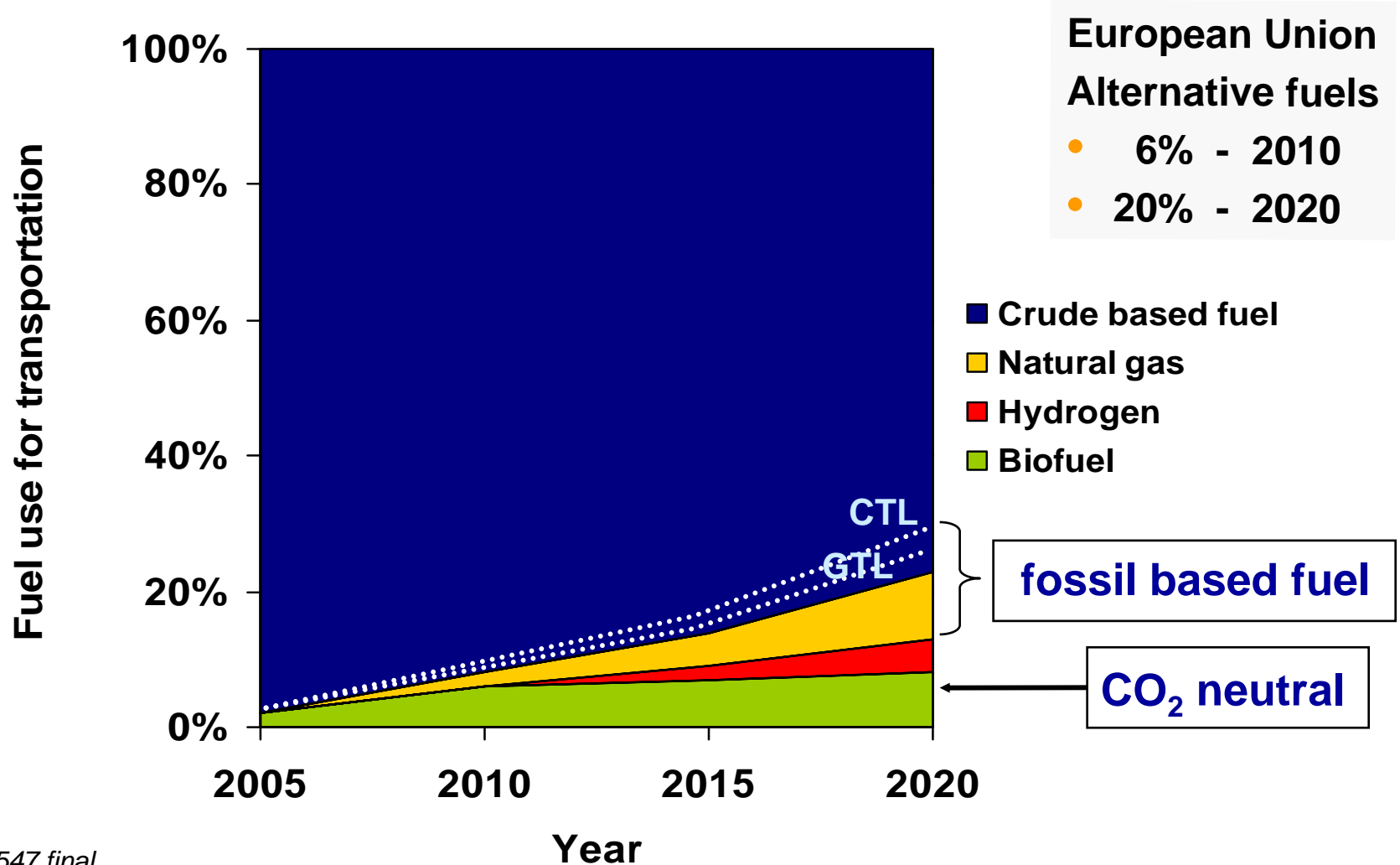
# "Well-to-wheel" analysis

Volvo study



# Future Fuel Sources, Outlook

Renewable fuels are not “Alternative” rather “Complementary”



Source: COM(2001) 547 final

# DME - Dimethylether

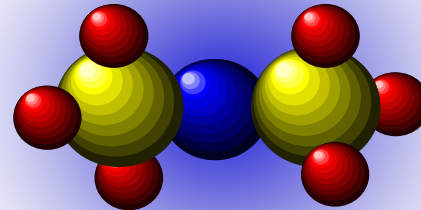
A multi source and multi purpose fuel

Natural gas

Other fossil  
sources

Bio-mass

DME



Power  
generation

Diesel

Fuel cell

Domestic gas

Chemical  
feedstock

## 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<sub>2</sub> issue.
- Best Well-to-Wheel efficiency obtained through the DME route.
- The use of DME eliminates the PM issue.
- Regionally natural gas will increase in importance as a logistic fuel.
- ***Diesel pump price will continue to escalate.***

## 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<sub>2</sub> neutral if produced from biomass.
  - No PM in the exhaust gases.
- **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



**Time to act!**