

# THE INNOVATION CHALLENGE

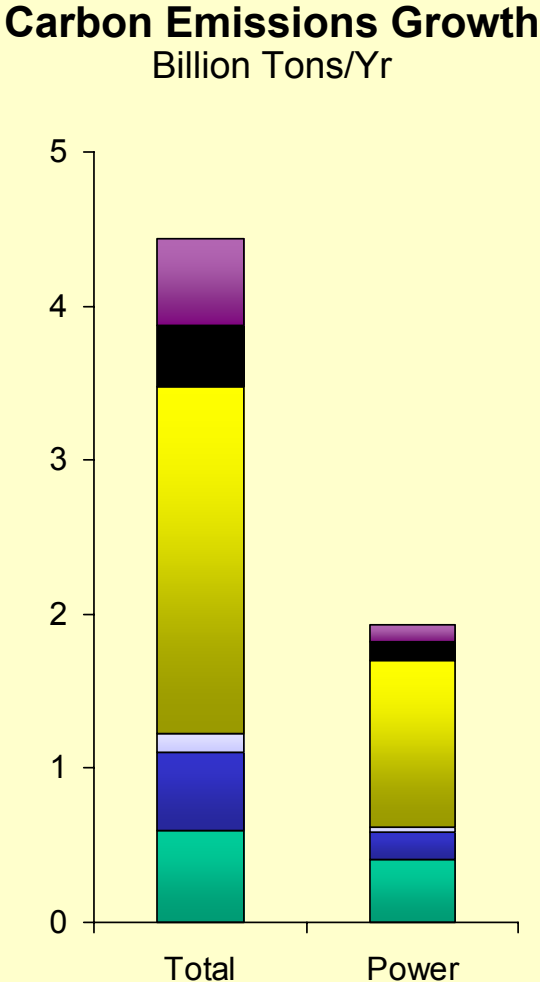
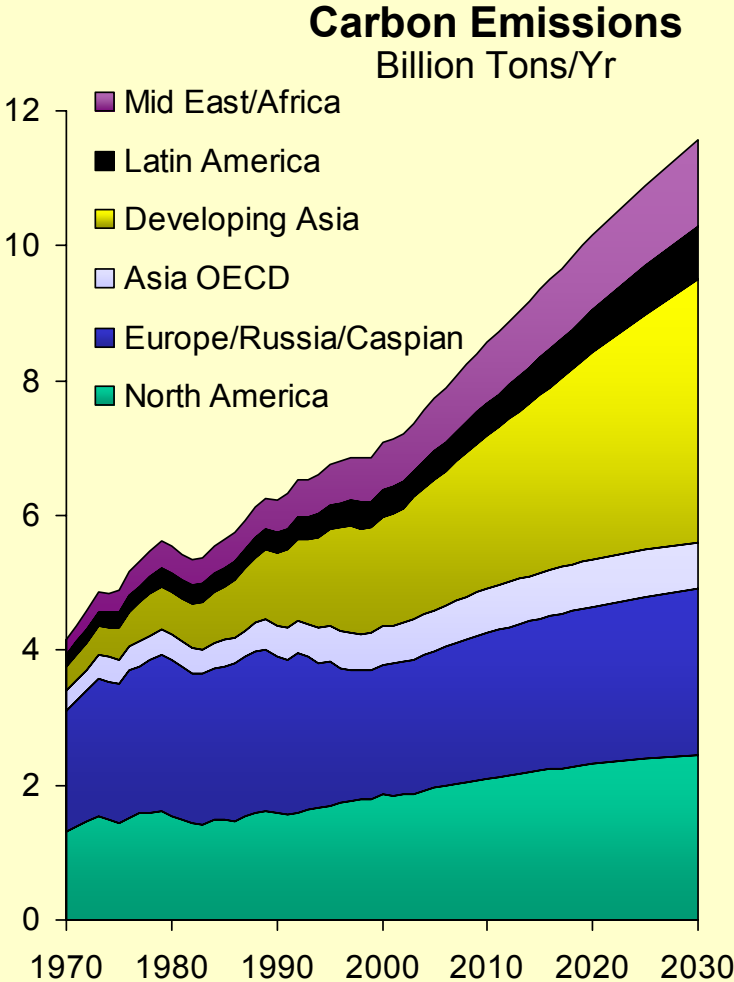
Post-2012 Climate Policy for the EU  
Stakeholder Meeting – 22 November 2004  
A. Heilbrunn                      TOTAL/UNICE

## MAIN POINTS

- We are going in the wrong direction  
Technology key to limit adjustments in lifestyle
- What technology means in terms of policies
- Downstream oil industry
- Transport in EU
  - the way forward for cars
  - the way forward for fuels
- Conclusions

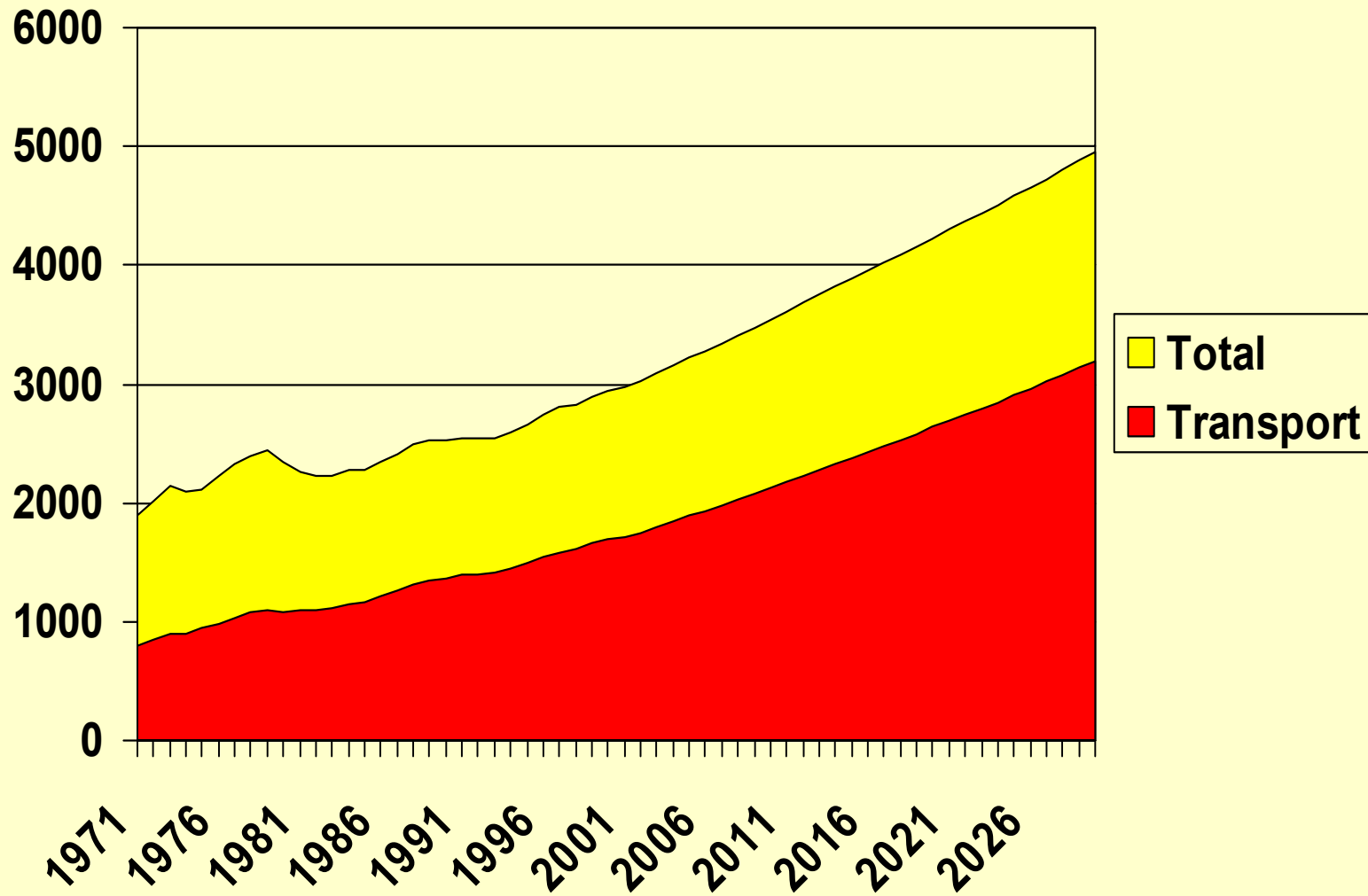
- Climate is a global problem  
EU represents only some 14% of ww emissions
- EU leaders need strong leadership to bring us & developing countries back to the drawing board
- China emissions were 2,6 billiont CO<sub>2</sub> in 1994  
In some years they will emit more than EU

# World Carbon Emissions



- Increasing CO<sub>2</sub> emissions
- ☐ Especially in developing countries
- ☐ Coal a major contributor

# World Oil Consumption 1971-2030 (Final Consumption, Mtoe)



Source: IEA historical data and projection from *World Energy Outlook 2002*

- If we want to stabilise GHG concentration in atmosphere at a reasonable level : Commission suggests 550 ppm  
We shall need a drastic reduction in our emissions:  
around 50 to 70% of 1990 emissions by 2050
- The more we can do through technologies, the less we need to ask voters to change their lifestyle
- Science on Climate could be insufficient to convince voters to change
- Massive technological improvements will be necessary to reach the goal

# TECHNOLOGIES : UNICE RECOMMANDATIONS

- Q4 of Consultation on past 2012
- Governments should provide the enabling conditions to allow the development of a portfolio of cost effective energy and mitigation technological solutions
- Policies and measures should also be pursued to increase the use of energy and use efficient technologies and no or low emitting technologies
- It is essential to encourage innovation by investing directly in R&D to develop a portfolio of cost effective technological solution
- Communication must be focussed on the consumer to adapt every day behaviour

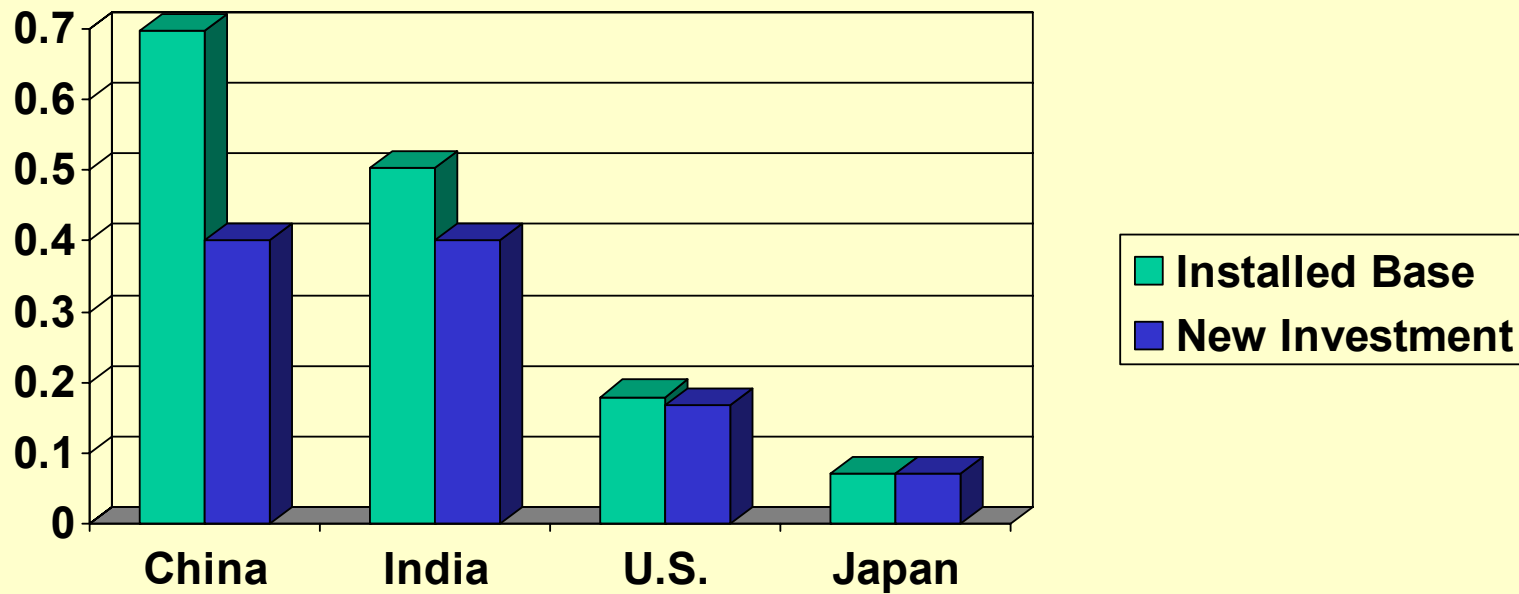
# SITUATION IN THE US

- No support for KYOTO protocol
- But                    Global Change Research Act of 1990  
                          Climate Change Research Initiative 2001
- US Climate Change Technology Program
- Broad range of Research Subject : transport, buildings, Infrastructure, Industry
- Low emission powertrains and fuels  
Hydrogen, nuclear, renewable
- Carbon capture & sequestration
- In addition to additional resources on Climate
- Altogether close to 2 bnUS\$ each year, half of it in Scientific Research



## What Technologies Are Key Developing Countries Using Today?

### Greenhouse Gas Emissions Per Dollar of Output



Charles River Associates 2003

## How can we stimulate R&D to create innovative, affordable, low GHG technologies sooner

- Performance
- Cost
- Consumer acceptance
- Safety
- Enabling infrastructure and capacity
- Regulatory compliance



Especially critical for developing countries

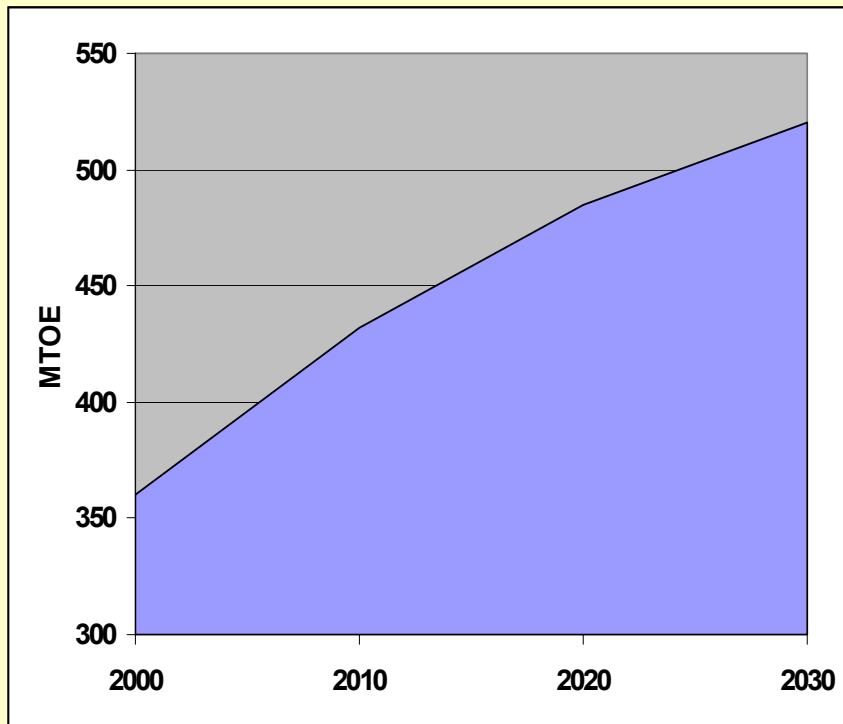
Weakest link paradigm: failure in any dimension will prevent widespread commercialization

## ON THE INDUSTRY SIDE: OIL DOWNSTREAM INDUSTRY

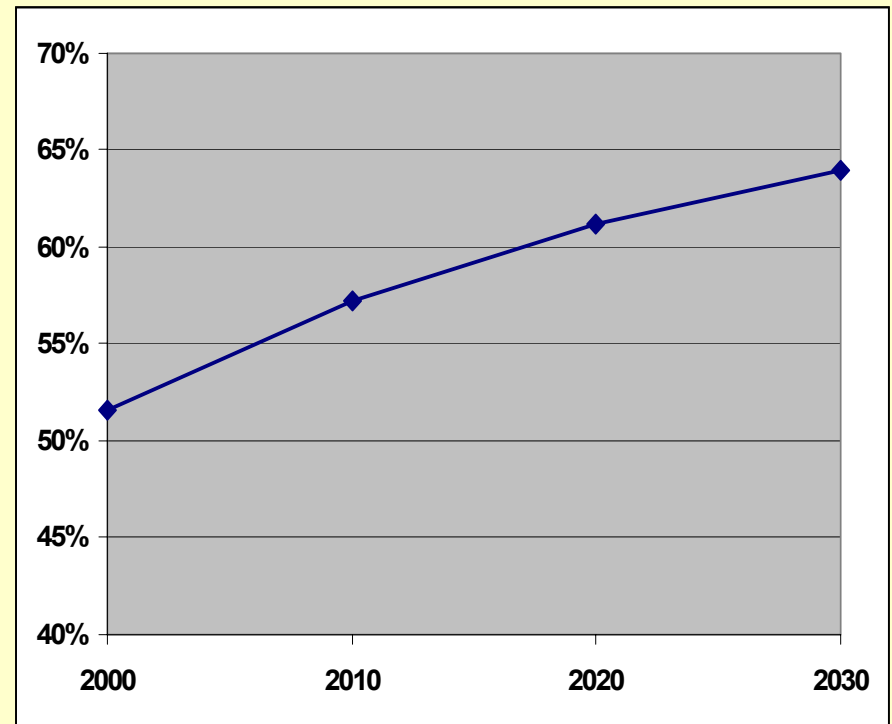
- Industry improve energy efficiency by approx. 1% per year. Is it enough
- If a breakthrough can be obtained by a new technology, how to keep EU industry competitive
- All evolutions do not reduce CO<sub>2</sub> emissions  
In oil refining industry
  - + desulphuration of fuels
  - + phase out of heavy fuel oil
  - + switch of of the auto market from gasoline to diesel
    - need construction of deep conversion units
    - the consequence is an increase of CO<sub>2</sub> emissions from refineries up to 35%
- Industry without electricity generation which represents some 20% of EU emissions have a limited potential of reductions if we exclude delocalisation and CO<sub>2</sub> sequestration

## Transport energy use and oil share projected to keep rising in OECD Europe

Transport energy use:  
44% increase 2000-2030



Transport share of total oil use: 52% in 2000, 63% in 2030

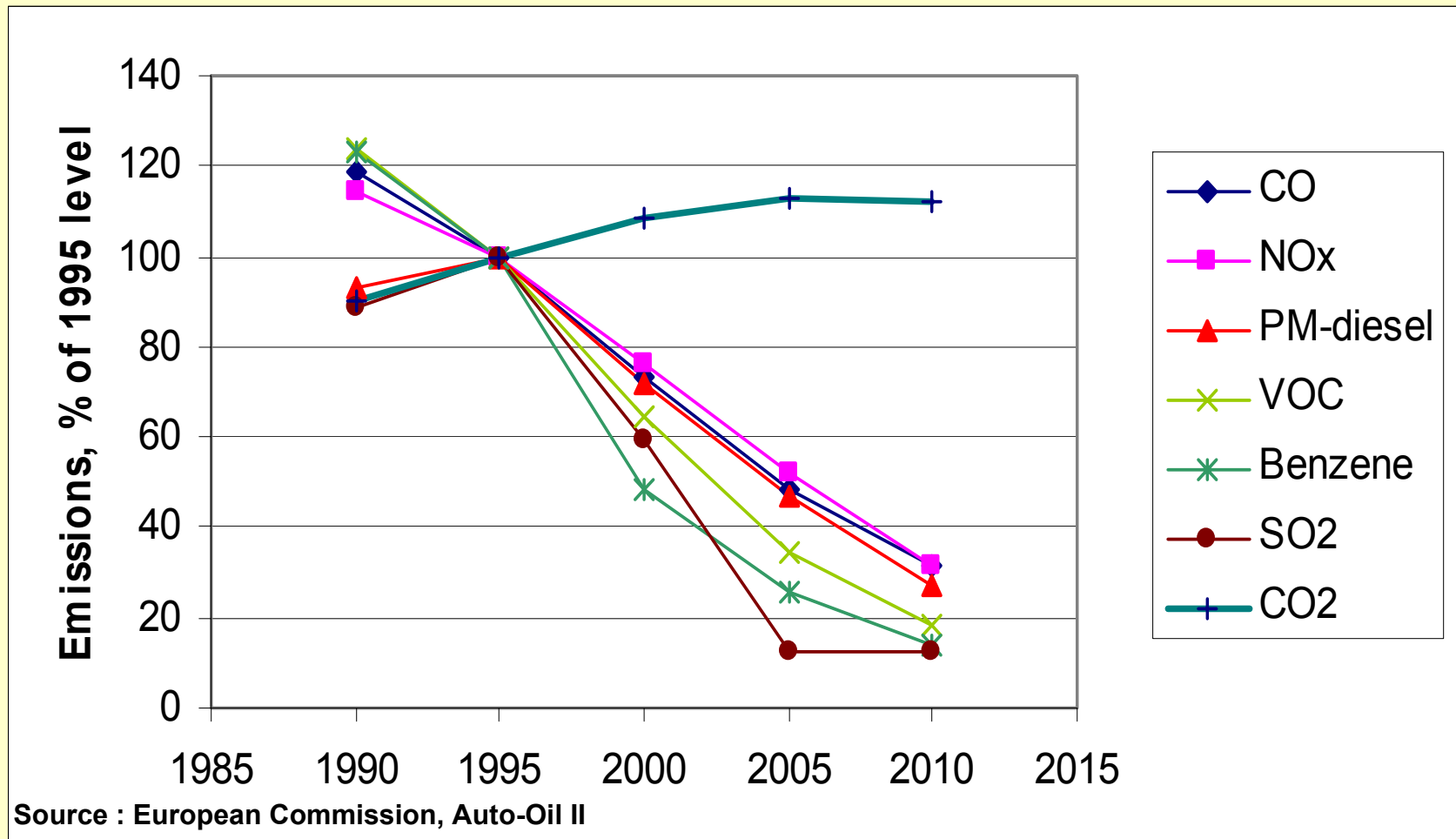


Source: IEA projections from *World Energy Outlook 2002*

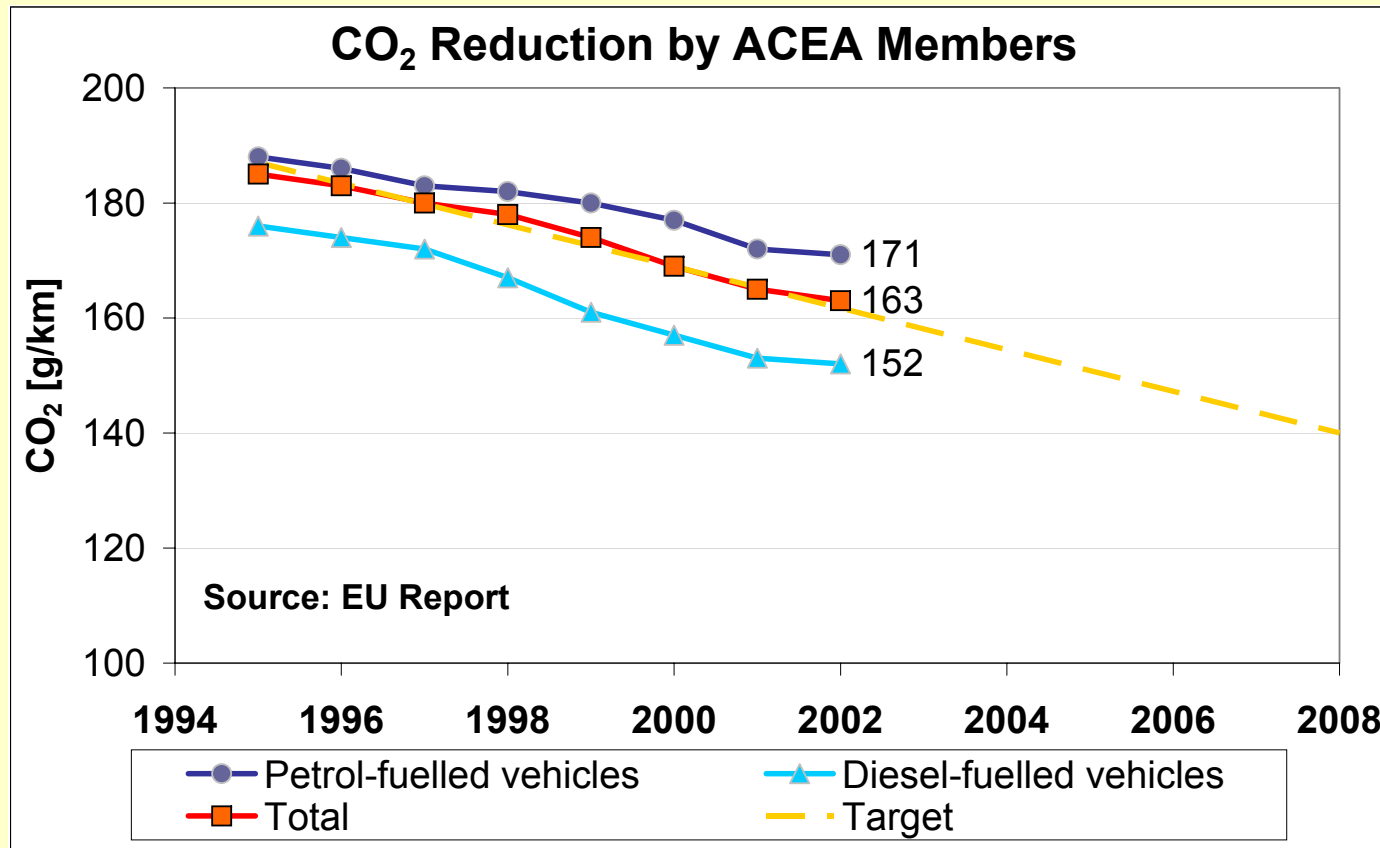
concaawe

- From now to 2100, can we anticipate fossil energy supply, will fit to the increasing demand ?
- Probably nobody knows exactly today
- But if we are in energy constrained world, the objective will not only be to minimize CO<sub>2</sub> emissions but also to minimize energy consumptions.  
In such a case, some alternative technologies and alternative fuels will be eliminated just because they are too energy intensive.

# INCREASING FOCUS ON GREENHOUSE GAS EMISSIONS

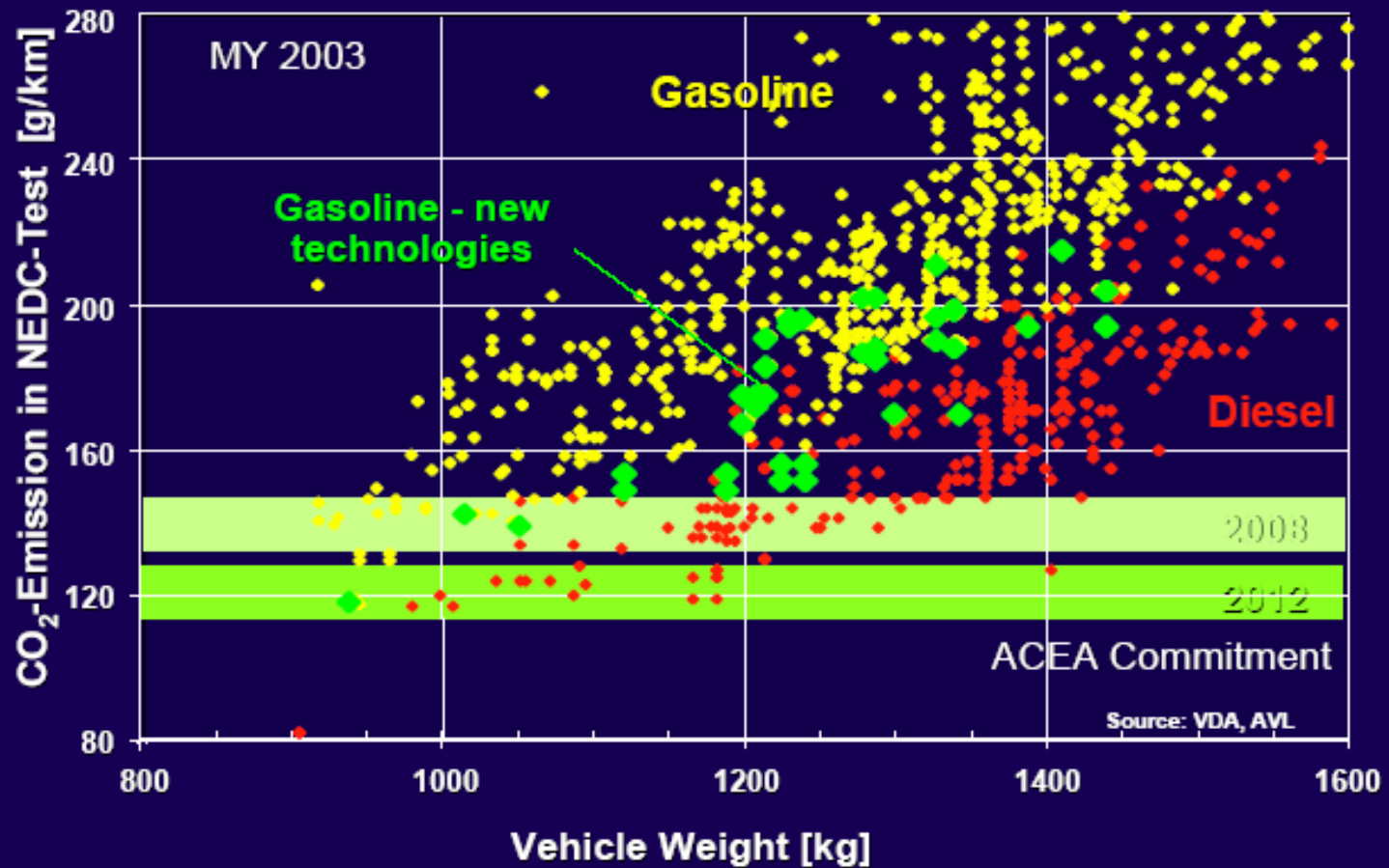


# PROGRESS IN VEHICLE CO<sub>2</sub> REDUCTION



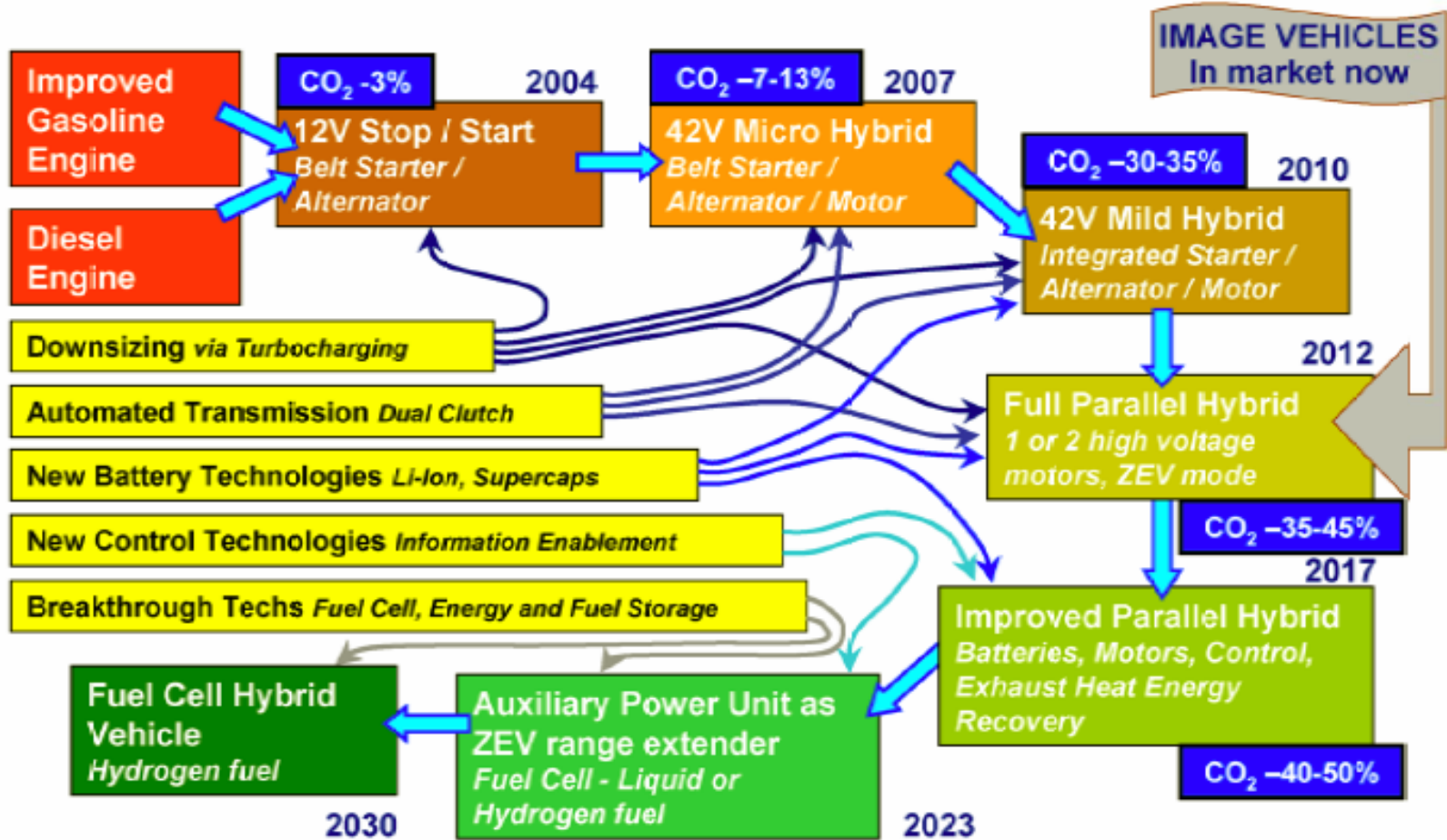
- ACEA “on-track” for 2008, but not positive about Commission’s target of 120 g/km by 2012 (indicated 133 g/km as practical minimum)
- “FURORE” identifies 95 g/km by 2020 and 80 g/km by 2030 as realistic research targets (but does not discuss affordability or implementation)

# CO<sub>2</sub>- Emission in NEDC-Test



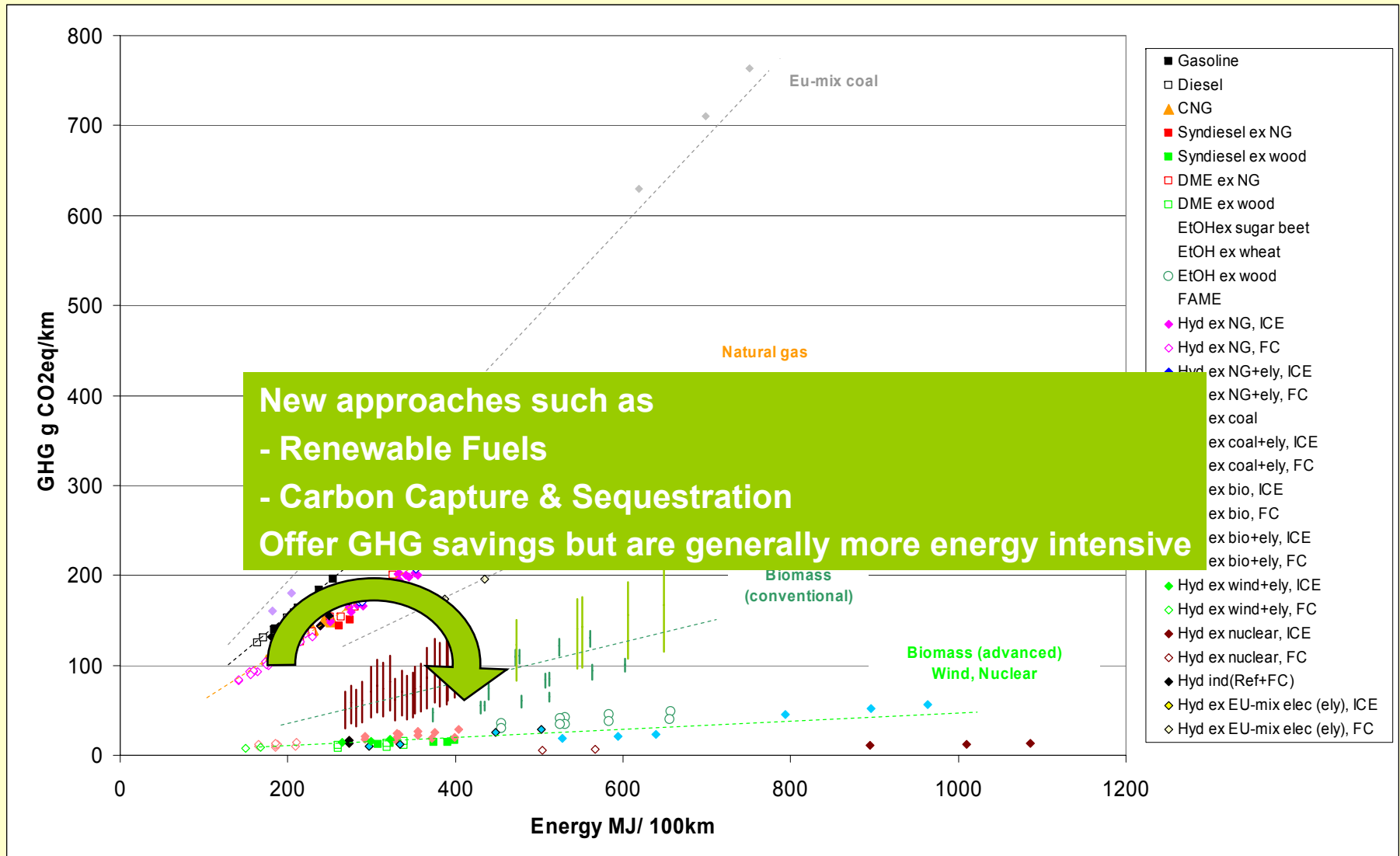


# Improved IC engines with hybridisation offers a low carbon route to hydrogen fuel cell vehicles in the medium term



Source: Ricardo Consulting Engineers

# EUCAR/JRC/CONCAWE WELL-TO-WHEELS ANALYSIS OVERALL RESULTS – GHG EMISSIONS VS. ENERGY USE



# CONCLUSIONS

- Reducing GHG emissions is a global issue with no easy solutions
  - ❑ Contributions from a wide range of options will be needed
- Sulphur-free road fuels contribute by enabling the next generation of low emission vehicles to operate with best fuel efficiency
  - ❑ Advanced ICE vehicles, including hybrids, can make a significant contribution in the medium term
- Alternative fuels/powertrains have to be considered on a WTW basis
  - ❑ Research is needed on a wide range of technology options
  - ❑ Availability, practicality, cost reduction, customer acceptance are all key
- Renewable/low fossil carbon fuels may offer a significant GHG reduction potential but generally require more energy
  - ❑ The choice of fuel pathway is critical and no single pathway offers a short term route to high volumes of “low carbon” fuels
  - ❑ Maximizing the GHG reduction potential of renewable energies requires consideration of the overall energy needs including stationary applications
- Don't try to pick winners too early : research & development is needed!

# CONCLUSION

- We need now more research on new, more energy efficient technologies
- Us, with strong push on research & no constraints for industry is an additional challenge
- These researches must deliver more
- The price signal of CO2 abatement, thanks to the Emission Trading System, will not be sufficient to pay the price of new technologies and must not be for competitiveness reasons
- Actions in developing countries must be encouraged
- Early retirement of less efficient but still productive technologies must be encouraged