# Transport White Paper, Climate Roadmap & quantitative modelling results

**EU Transport GHG: Routes to 2050 II - 1st stakeholder conference**


## Marek Šturc

**European Commission - Climate Action DG**

Directorate A: International & Climate Strategy

Unit A4: Strategy & Economic Assessment


# Presentation Outline

**1) Climate Roadmap**: *A Roadmap for moving to a competitive low carbon economy in 2050*

**2) Transport White Paper**: *Roadmap to a Single European Transport Area - Towards a competitive and resource efficient transport system*

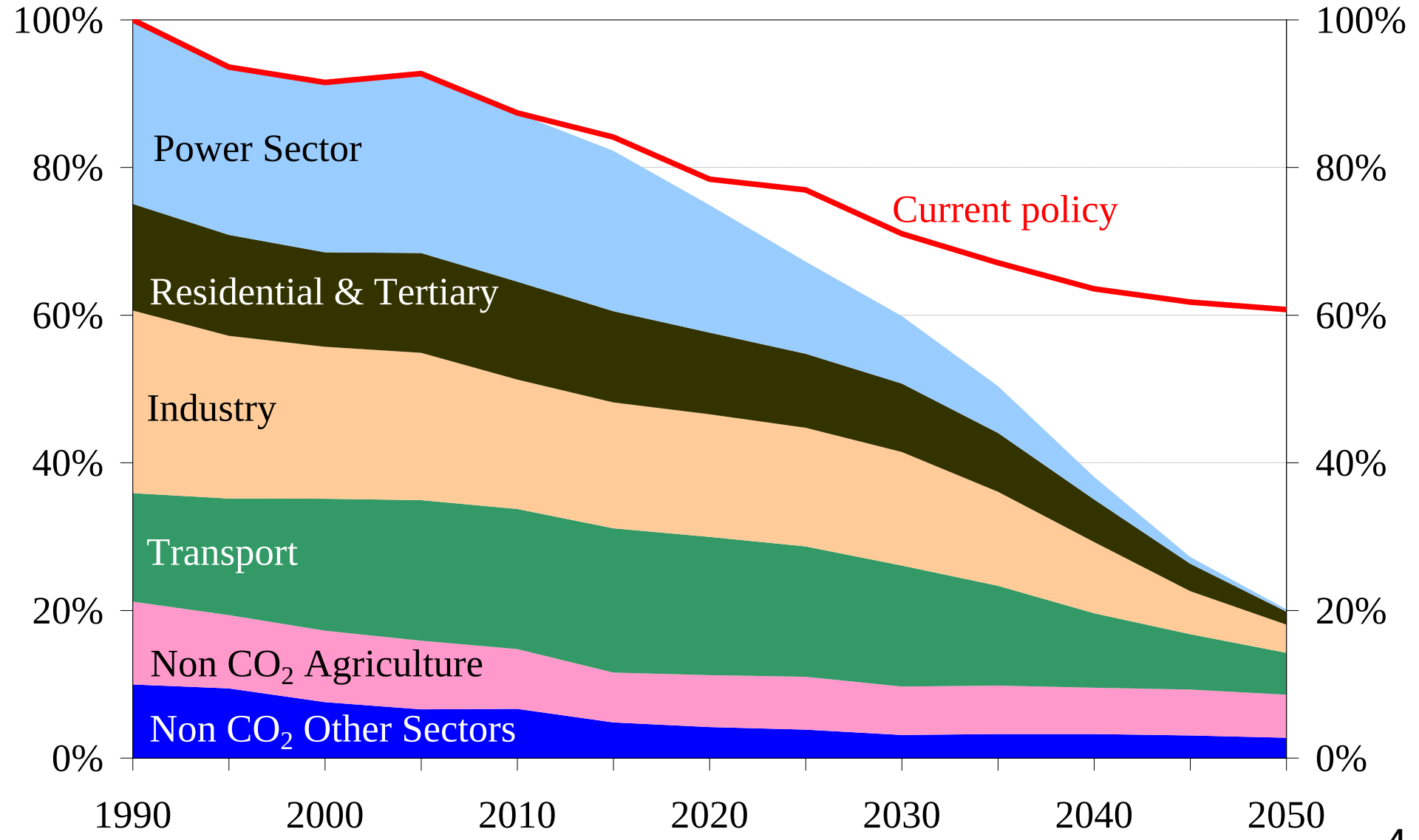
**3) Presentation focus:** modeling framework, quantitative analysis, data & results

# Part 1

# Roadmap for moving to a competitive low carbon economy in 2050

Climate Action

# A cost-efficient pathway towards 2050



# Sectoral milestones

**All sectors contribute!**

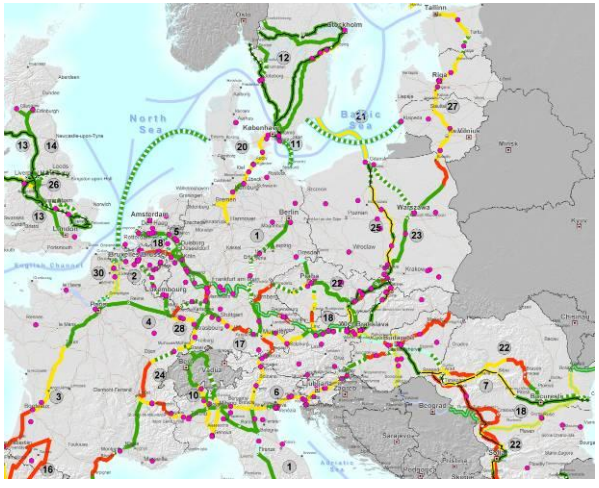
**… but in different manner:**

| GHG reductions compared to 1990 | **2005** | **2030** | **2050** |
|---|---|---|---|
| Power ($CO_2$) | -7% | -54 to -68% | -93 to -99% |
| Industry ($CO_2$) | -20% | -34 to -40% | -83 to -87% |
| **Transport (incl. $CO_2$ aviation, excl. maritime)** | **+30%** | **+20 to -9%** | **-54 to -67%** |
| Residential and services ($CO_2$) | -12% | -37 to -53% | -88 to-91% |
| Agriculture (non-$CO_2$) | -20% | -36 to -37% | -42 to -49% |
| Other non-$CO_2$ emissions | -30% | -72 to -73% | -70 to -78% |

## Part 2

# Roadmap to a Single European Transport Area

## Towards a competitive and resource efficient transport system



# GHG objectives in the 2011 Transport White Paper

- a reduction of at least 60% of GHGs by 2050 with respect to 1990 is required

- by 2030, the goal for transport will be to reduce GHG emissions to around 20% below their 2008 level - given the substantial increase in transport emissions over the past two decades, this would still put them 8% above the 1990 level

- low-carbon sustainable fuels in aviation to reach 40% by 2050

- by 2050 reduce EU $CO_2$ emissions from maritime bunker fuels by 40% (if feasible 50%)

# GHG related initiatives

The Transport White Paper has actions foreseen in a number of areas that will work to directly lower GHG emissions:

**6**: Adapt weight and dimensions legislation for HDVs

**24**: Technology roadmap (provided GHG is an important goal)

**26**: Regulatory framework for vehicles

**28**: Vehicle $CO_2$ labelling

**29**: Carbon footprint calculator

**30**: Eco-driving and LCV speed limits

**31**: Urban mobility plans

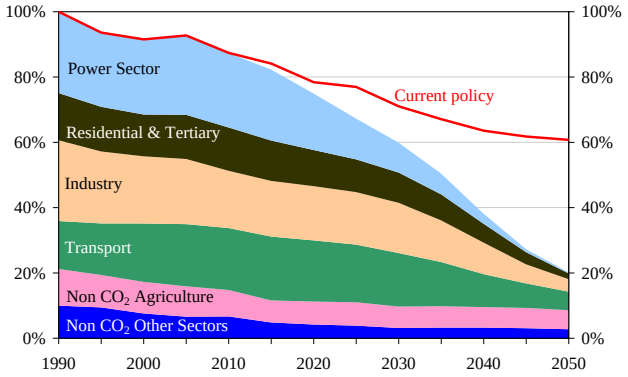
**32**: EU urban charging framework

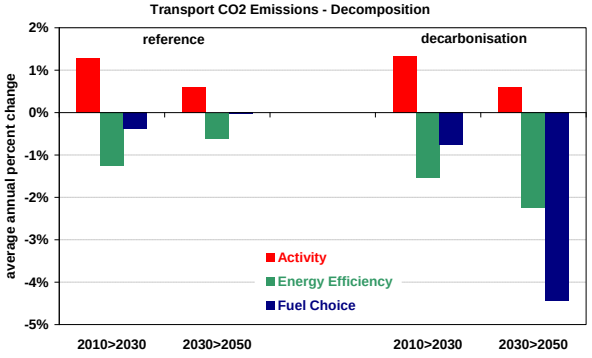
**33**: Low carbon city vehicles

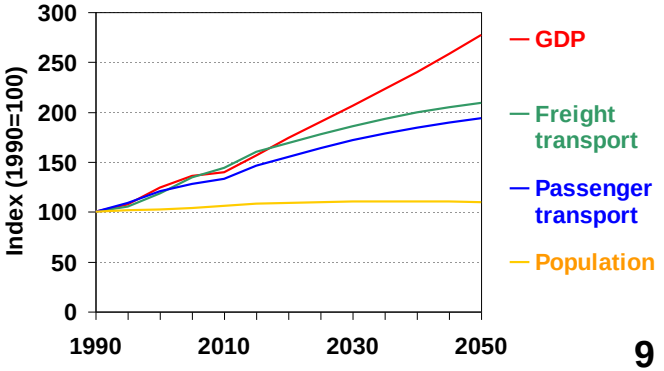
**39**: Smart pricing and taxation

# Part 3

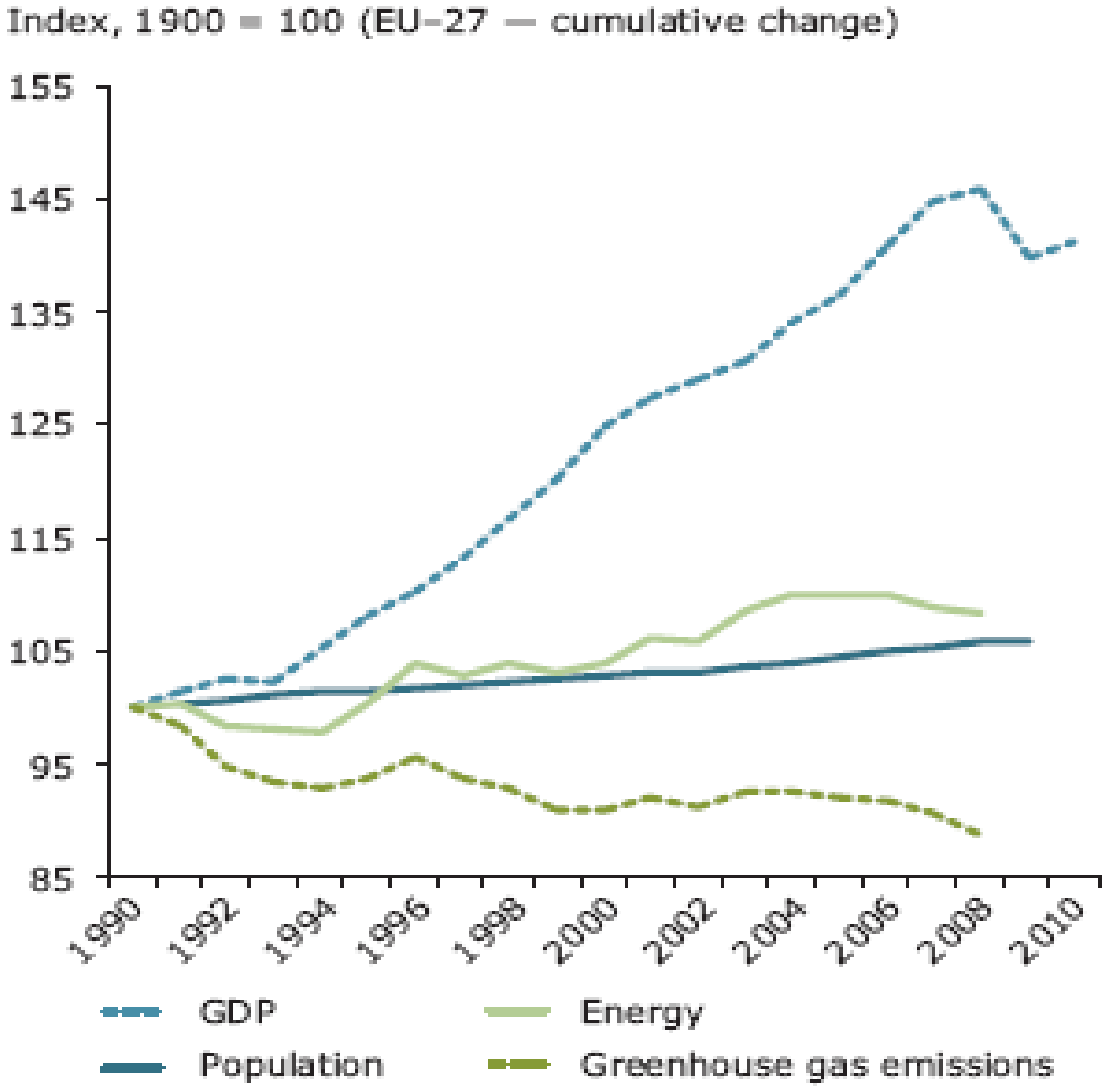
## modelling framework
## quantitative analysis
## data & results



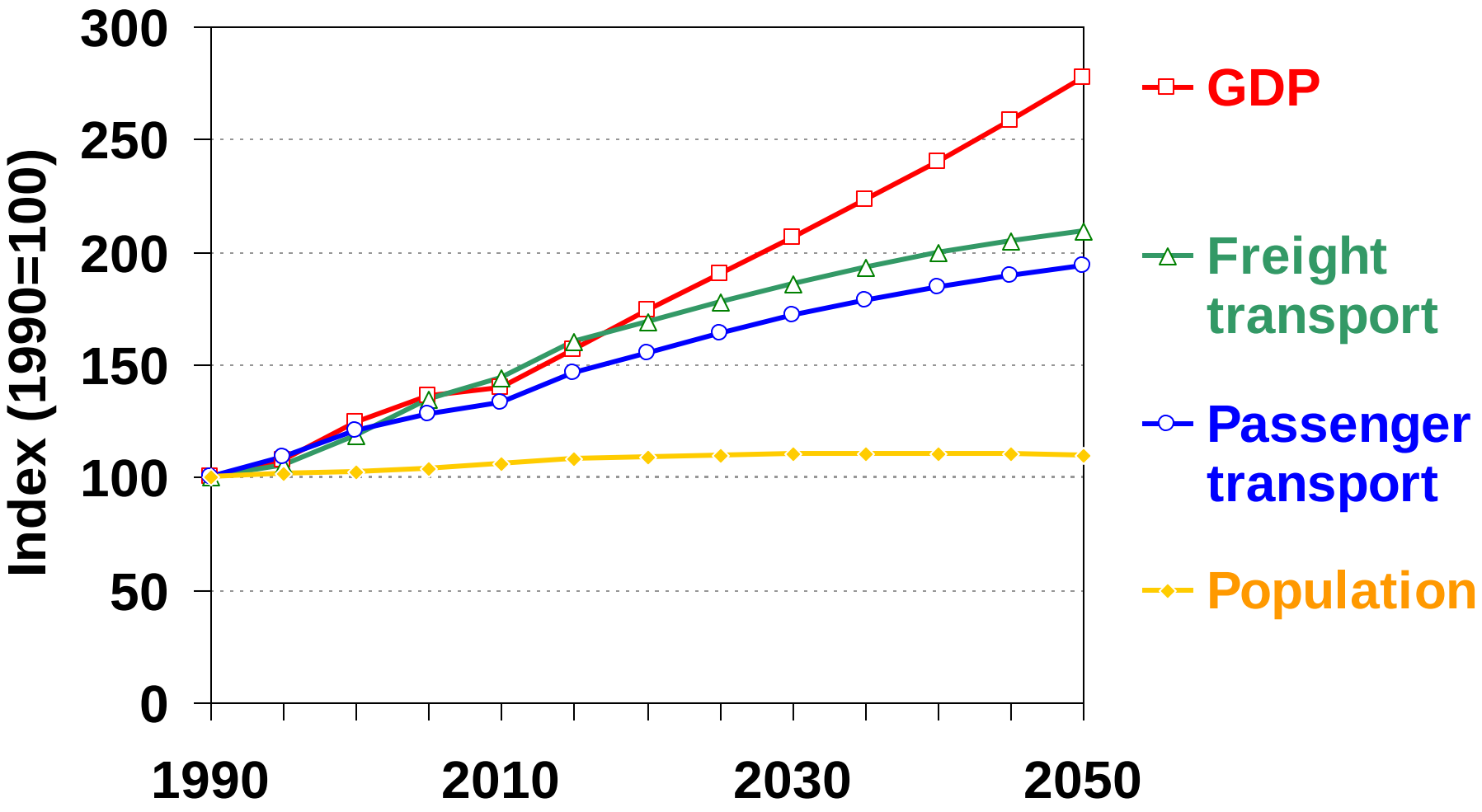



# Where is EU today?

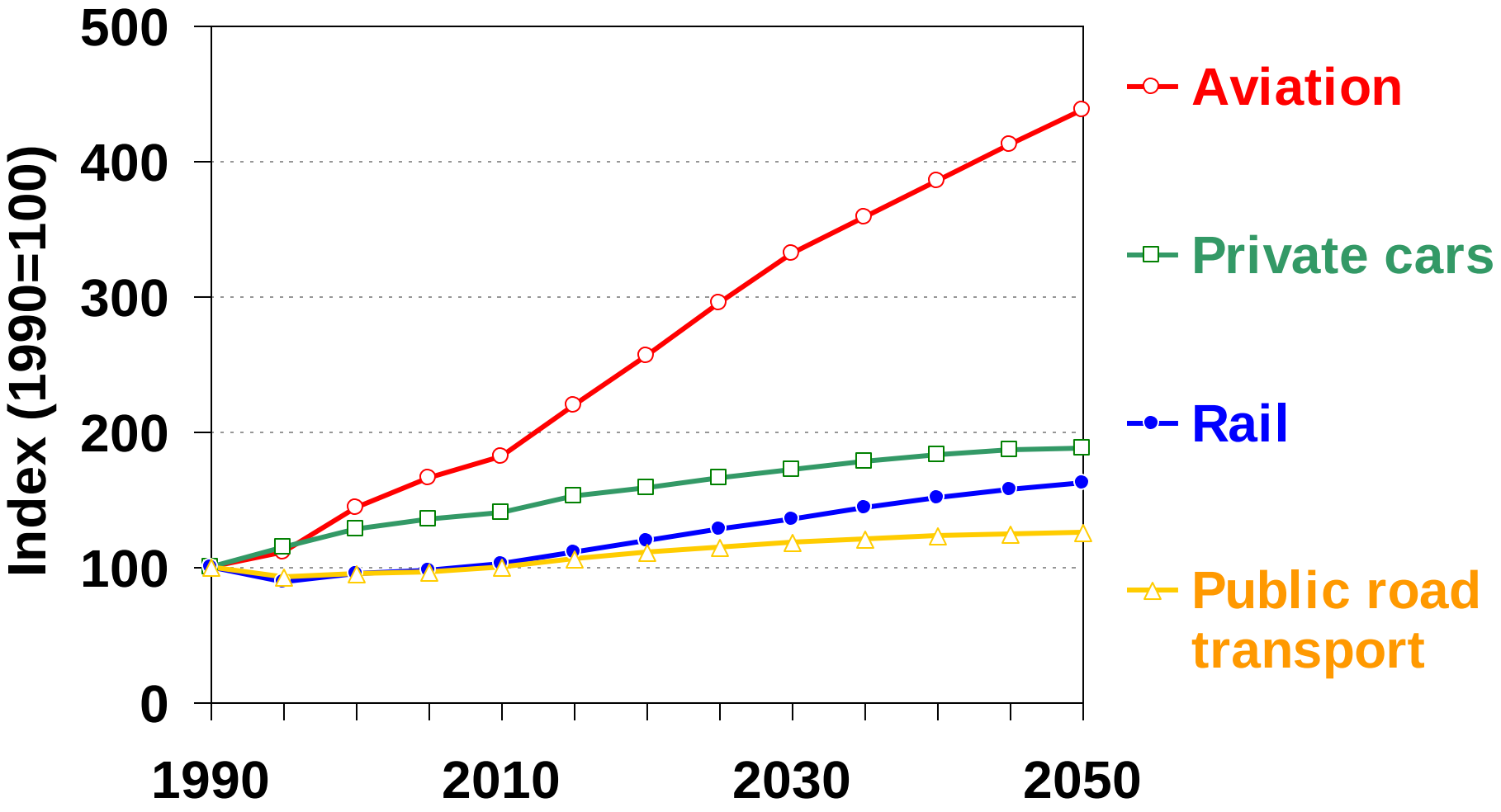


# EU27 Reference Scenario




Source: PRIMES modeling for EC's Impact Assessments

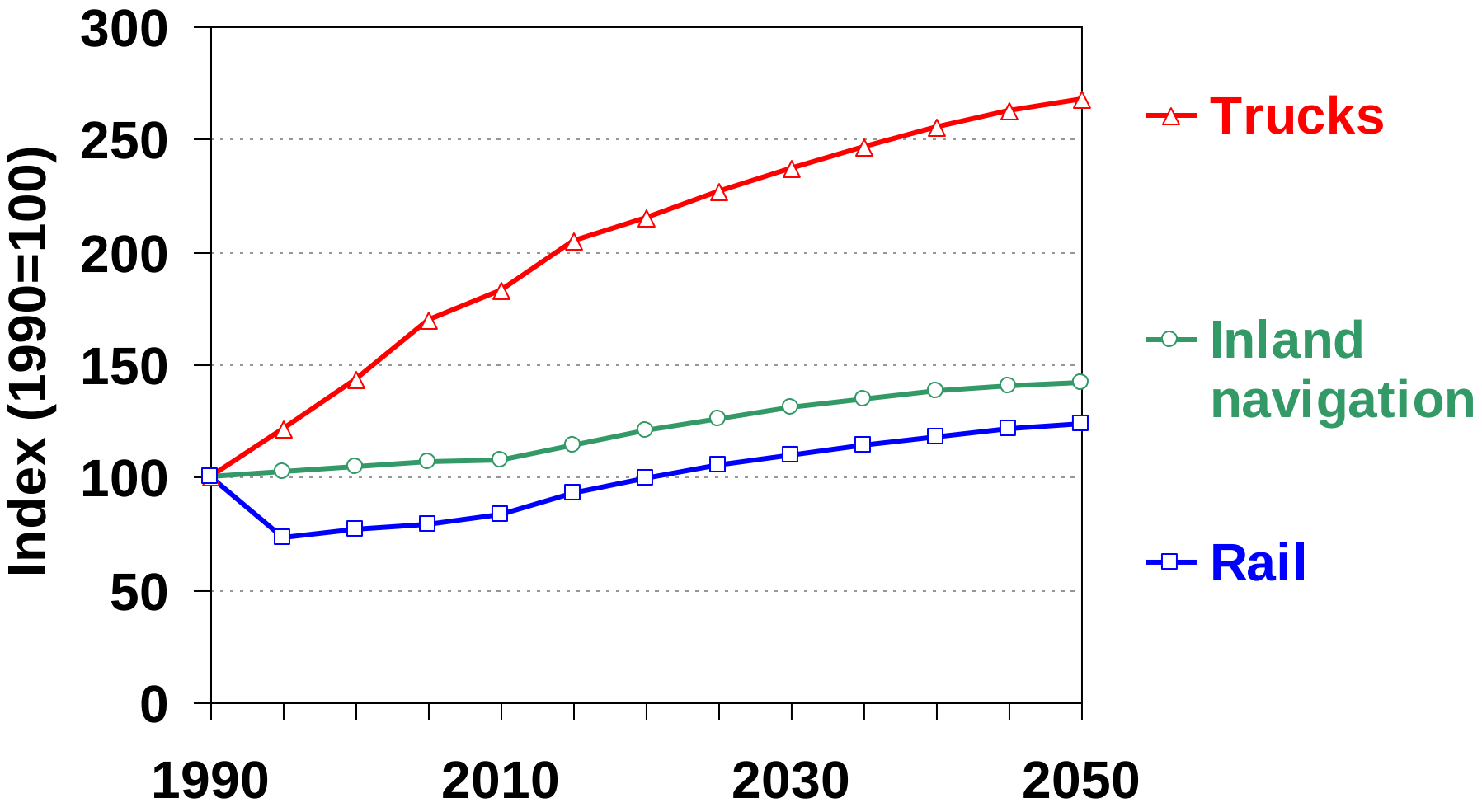
# EU27 Reference Scenario
## passenger-km




Source: PRIMES modeling for EC's Impact Assessments

# EU27 Reference Scenario

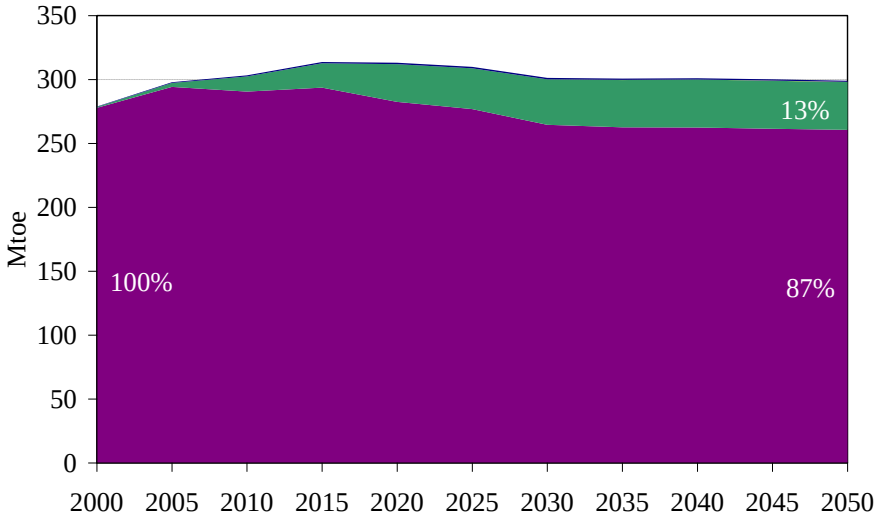
## tonne-km



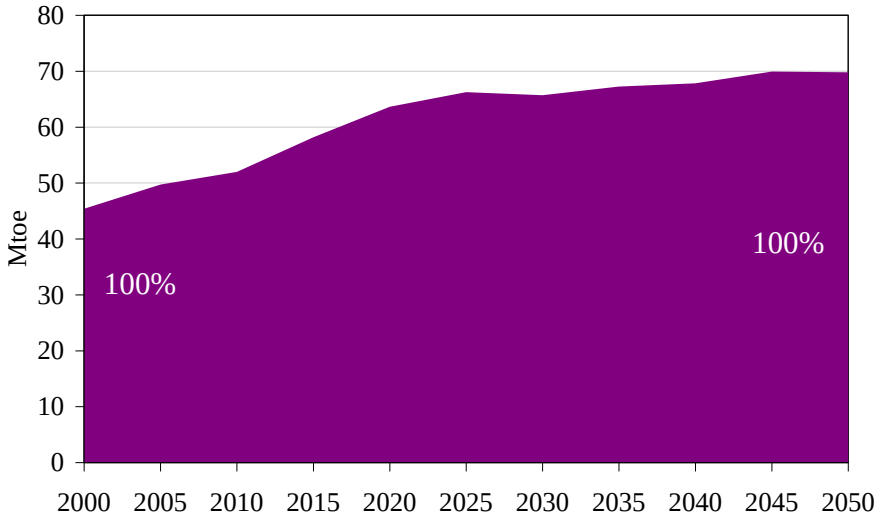

Source: PRIMES modeling for EC's Impact Assessments

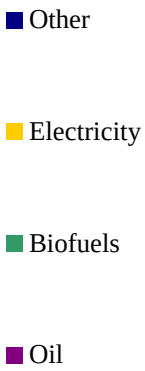
# Transport Energy Mix (1)

Road Transport Energy Mix [Mtoe]
Reference Scenario

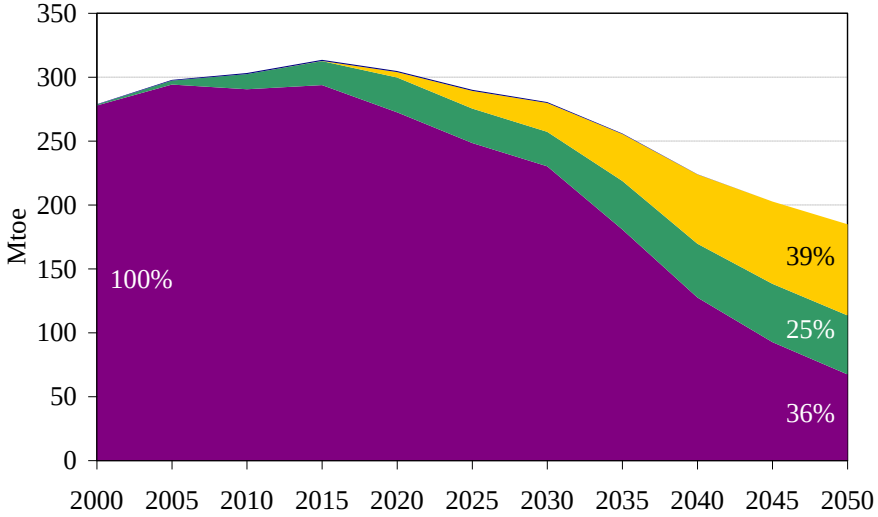



Aviation Energy Mix [Mtoe]
Reference Scenario

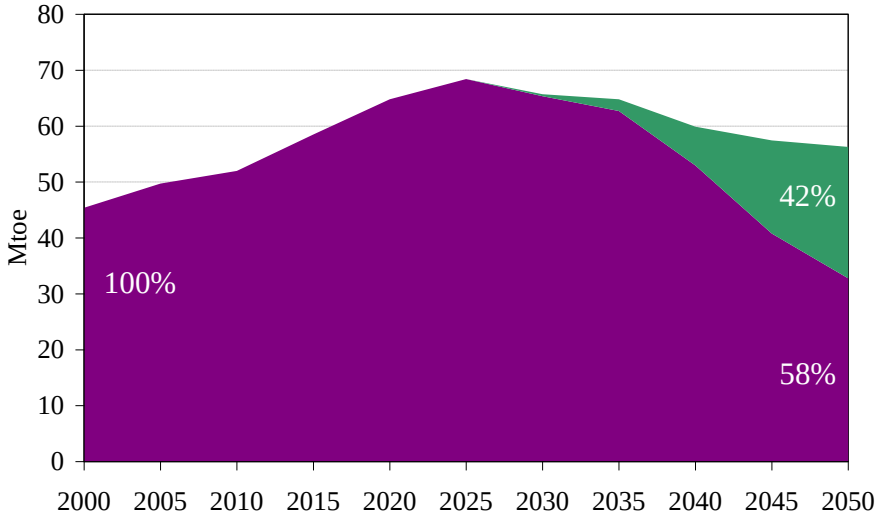


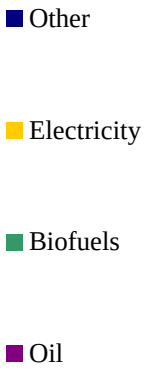




Road Transport Energy Mix [Mtoe]
Decarbonisation scenario under effective technologies and global climate action




Aviation Energy Mix [Mtoe]
Decarbonisation scenario under effective technologies and global climate action

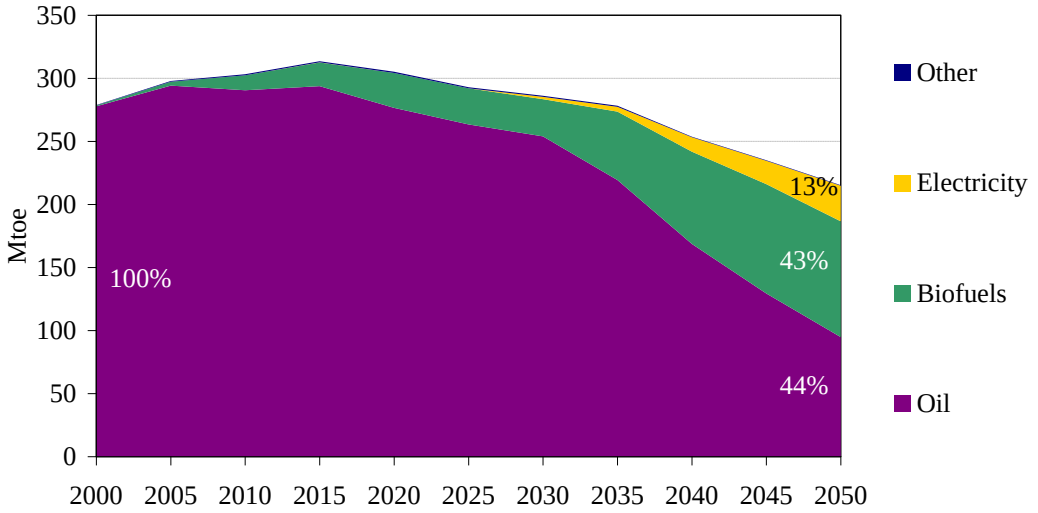


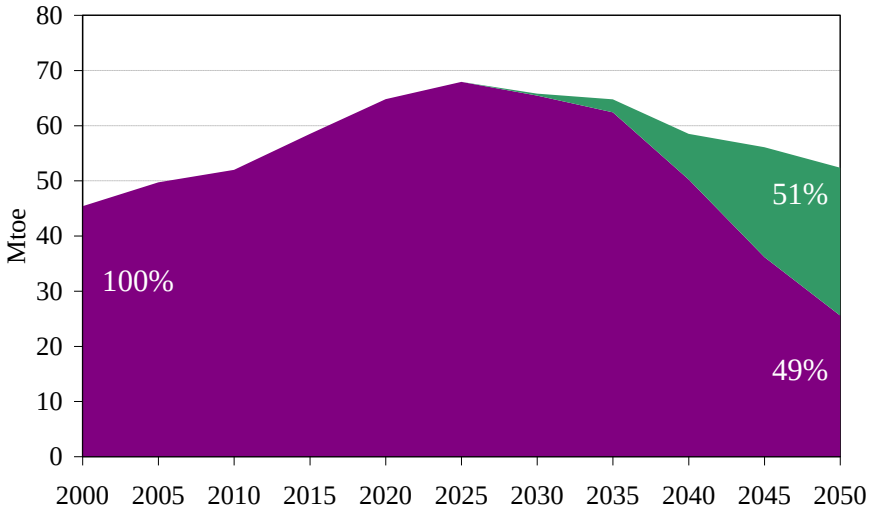

**Source: PRIMES modeling for EC's Impact Assessments**

# Transport Energy Mix (2)

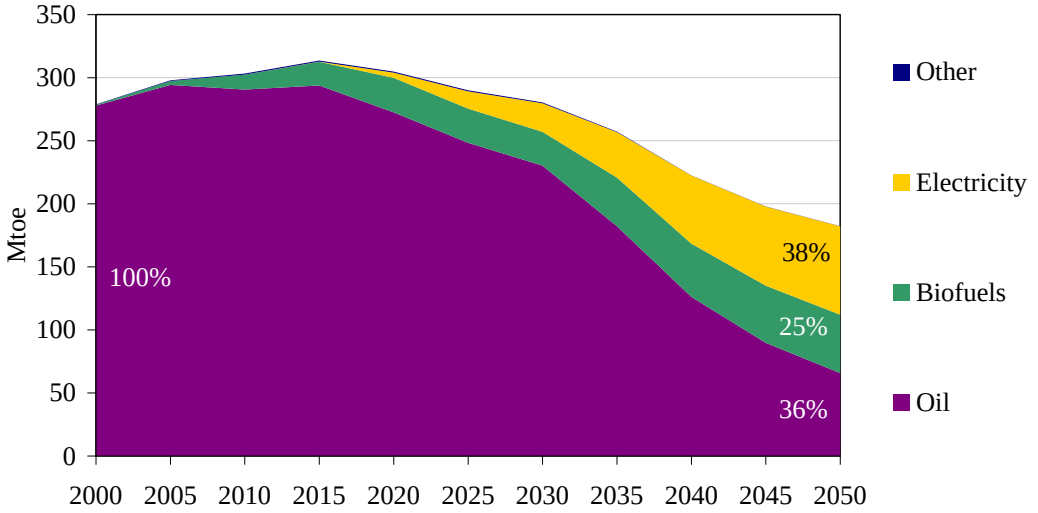
Road Transport Energy Mix [Mtoe]
Decarbonisation scenario under delayed electrification
and global climate action



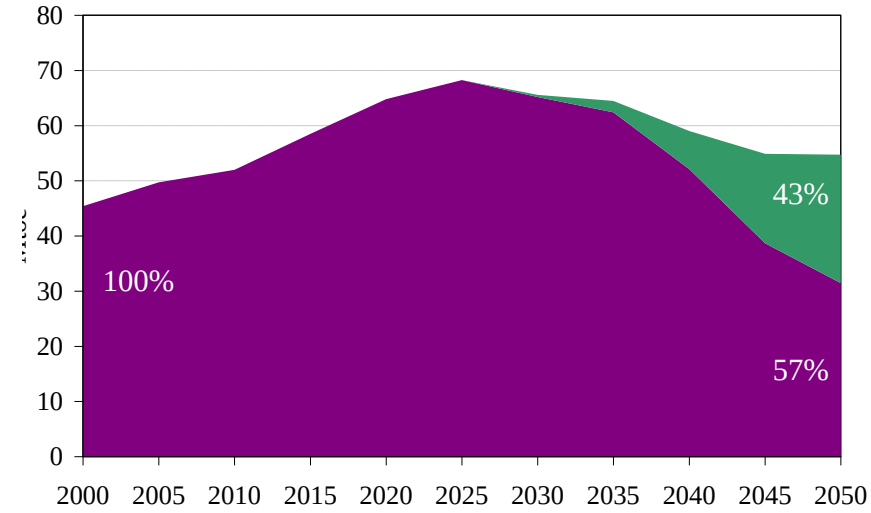

Aviation Energy Mix [Mtoe]
Decarbonisation scenario under delayed electrification
and global climate action




Road Transport Energy Mix [Mtoe]
Decarbonisation scenario under delayed CCS
and global climate action

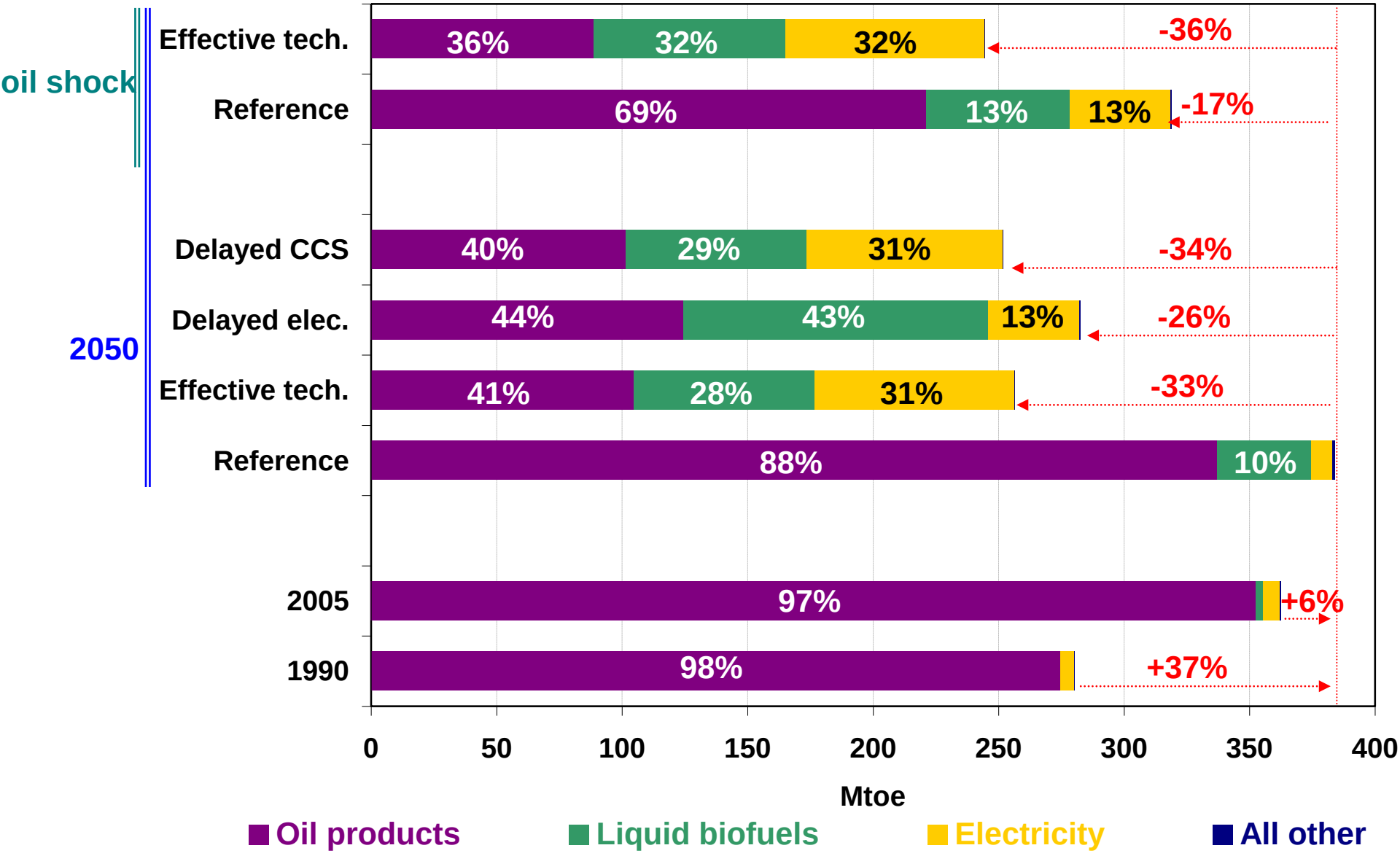



Aviation Energy Mix [Mtoe]
Decarbonisation scenario under delayed CCS
and global climate action



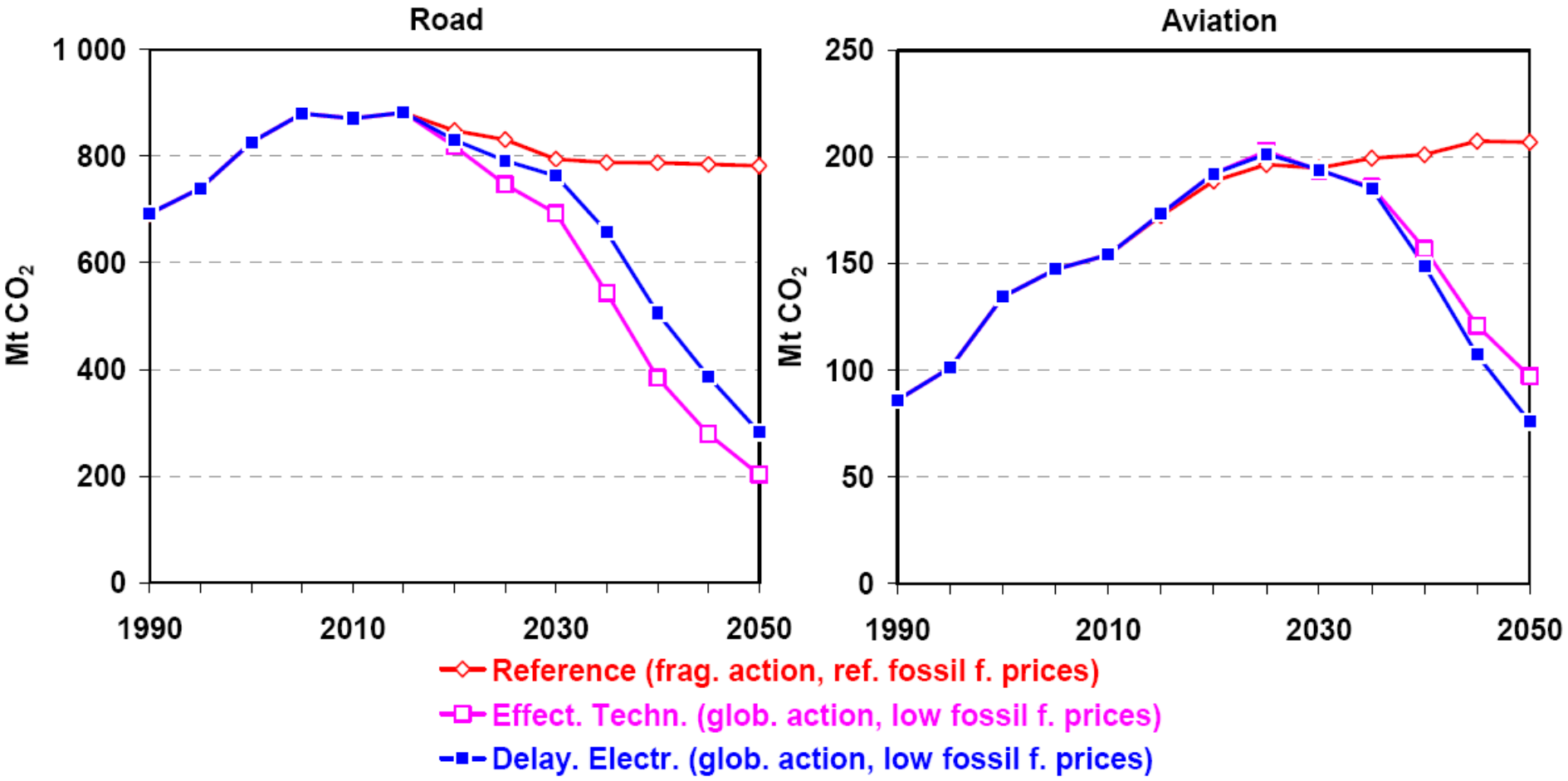

**Source: PRIMES modeling for EC's Impact Assessments**

# Transport Energy Mix (3)



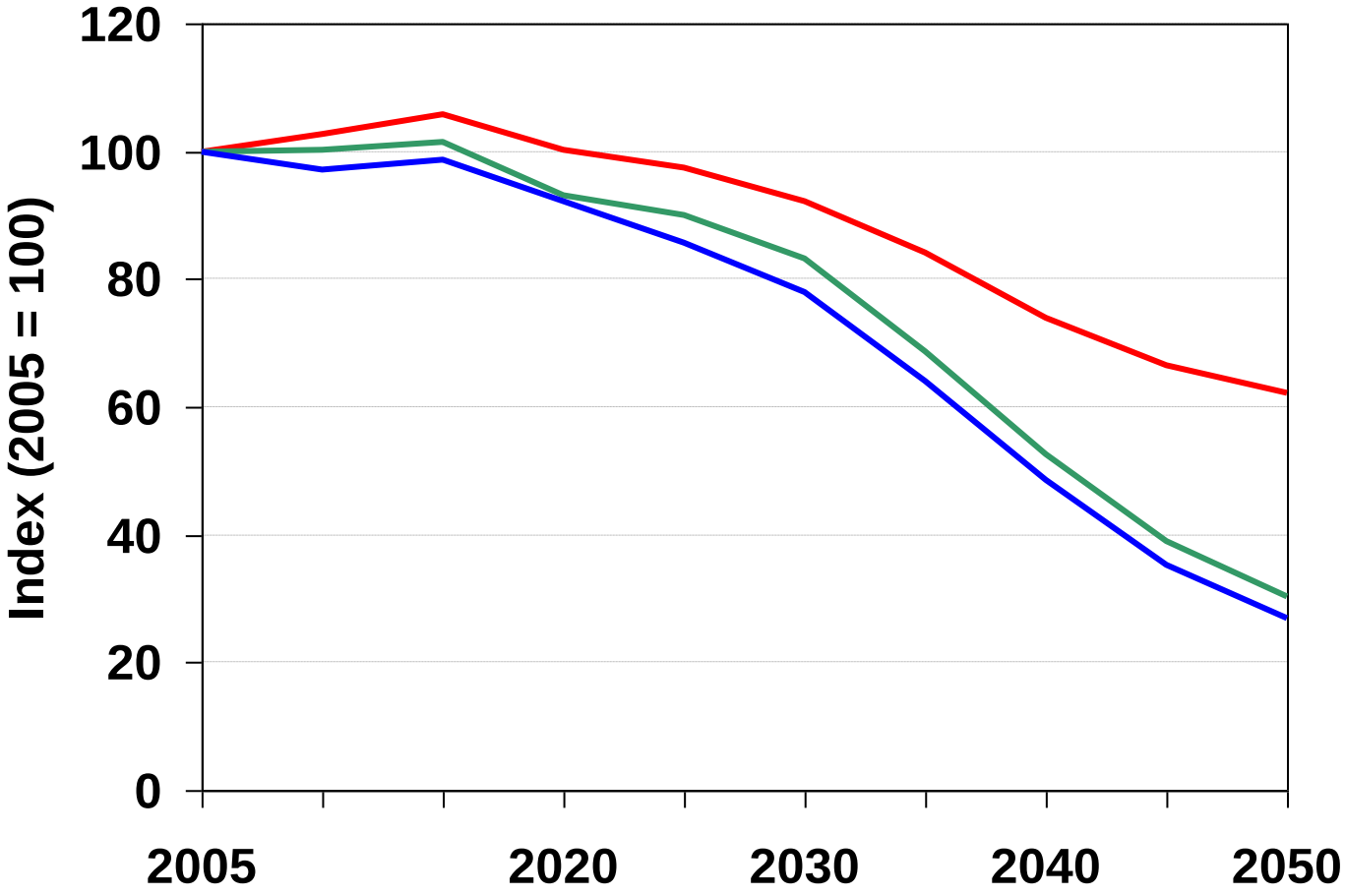

Source: PRIMES modeling for EC's Impact Assessments

# EU27 transport $CO_2$ emissions




Source: PRIMES modeling for EC's Impact Assessments

# TTW vs. WTW



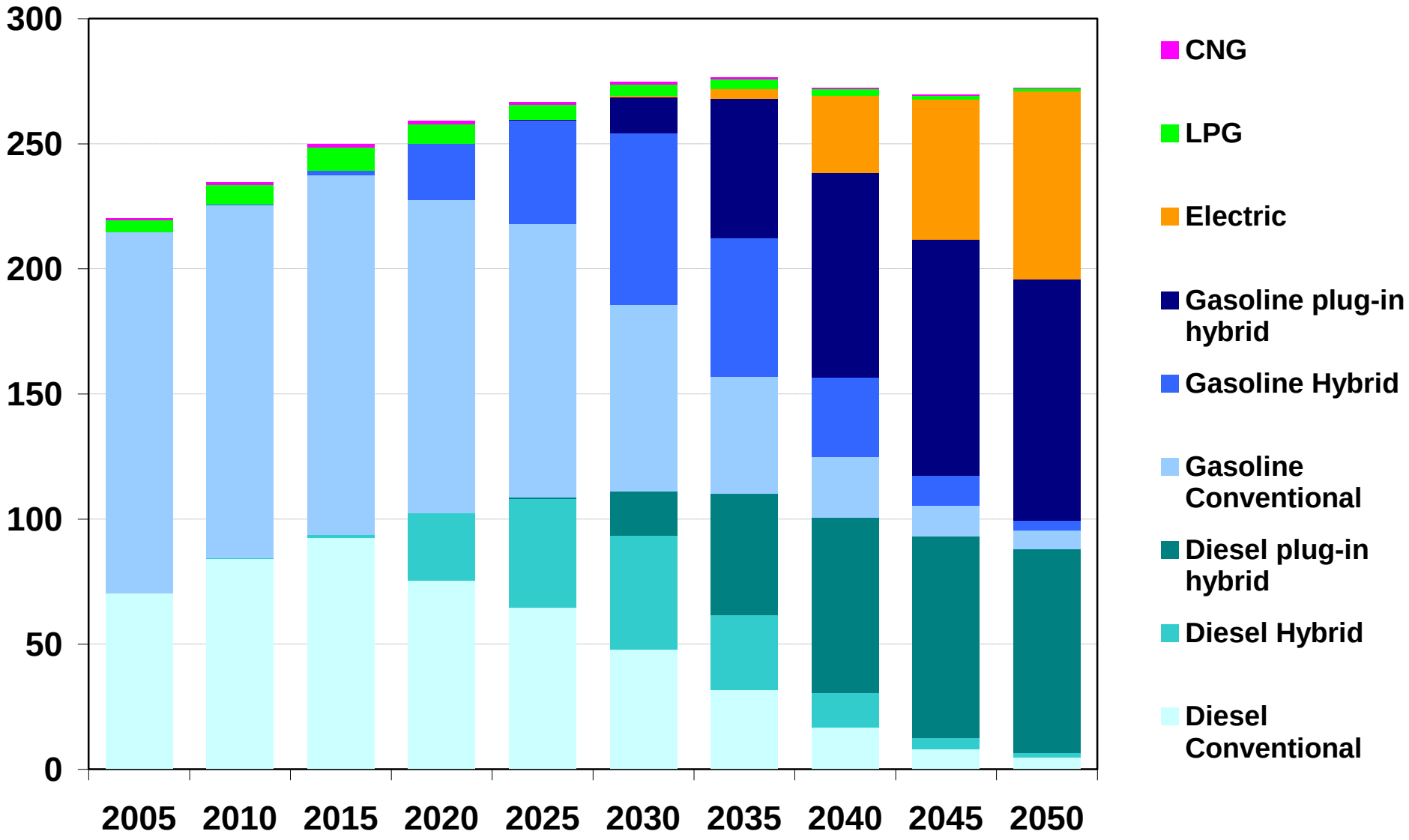

Source: PRIMES modeling for EC's Impact Assessments

# Share of different technologies in passenger transport activity (p-km) with passenger cars

| [%] | 1990 | 2020 | 2030 | 2040 | 2050 |
|---|---|---|---|---|---|
| **Reference scenario** | | | | | |
| Conventional ICE | 100.0 | 100.0 | 99.9 | 99.9 | 99.9 |
| Plug-in hybrids | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pure electric | 0.0 | 0.0 | 0.1 | 0.1 | 0.1 |
| **Decarbonisation scenario under effective technologies and global climate action** | | | | | |
| Conventional ICE | 100.0 | 92.0 | 69.1 | 29.1 | 13.6 |
| Plug-in hybrids | 0.0 | 5.5 | 16.6 | 31.8 | 19.5 |
| Pure electric | 0.0 | 2.6 | 14.3 | 39.0 | 66.8 |
| **Decarbonisation scenario under delayed electrification and global climate action** | | | | | |
| Conventional ICE | 100.0 | 99.9 | 97.4 | 83.7 | 62.4 |
| Plug-in hybrids | 0.0 | 0.0 | 2.1 | 14.0 | 16.2 |
| Pure electric | 0.0 | 0.1 | 0.5 | 2.3 | 21.4 |

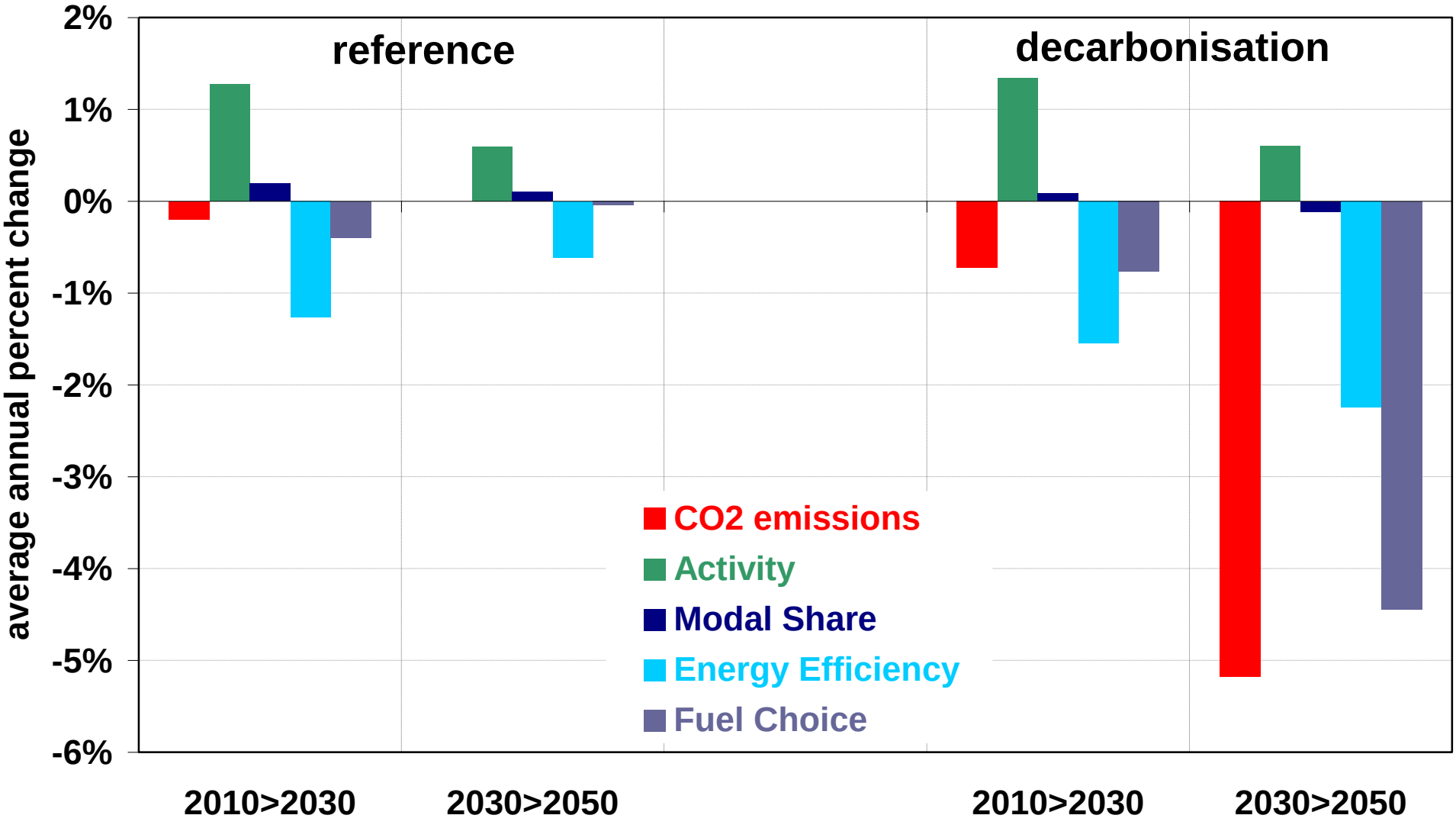
Source: PRIMES modeling for *Roadmap for moving to a competitive low carbon economy in 2050*

# Stock of passenger cars



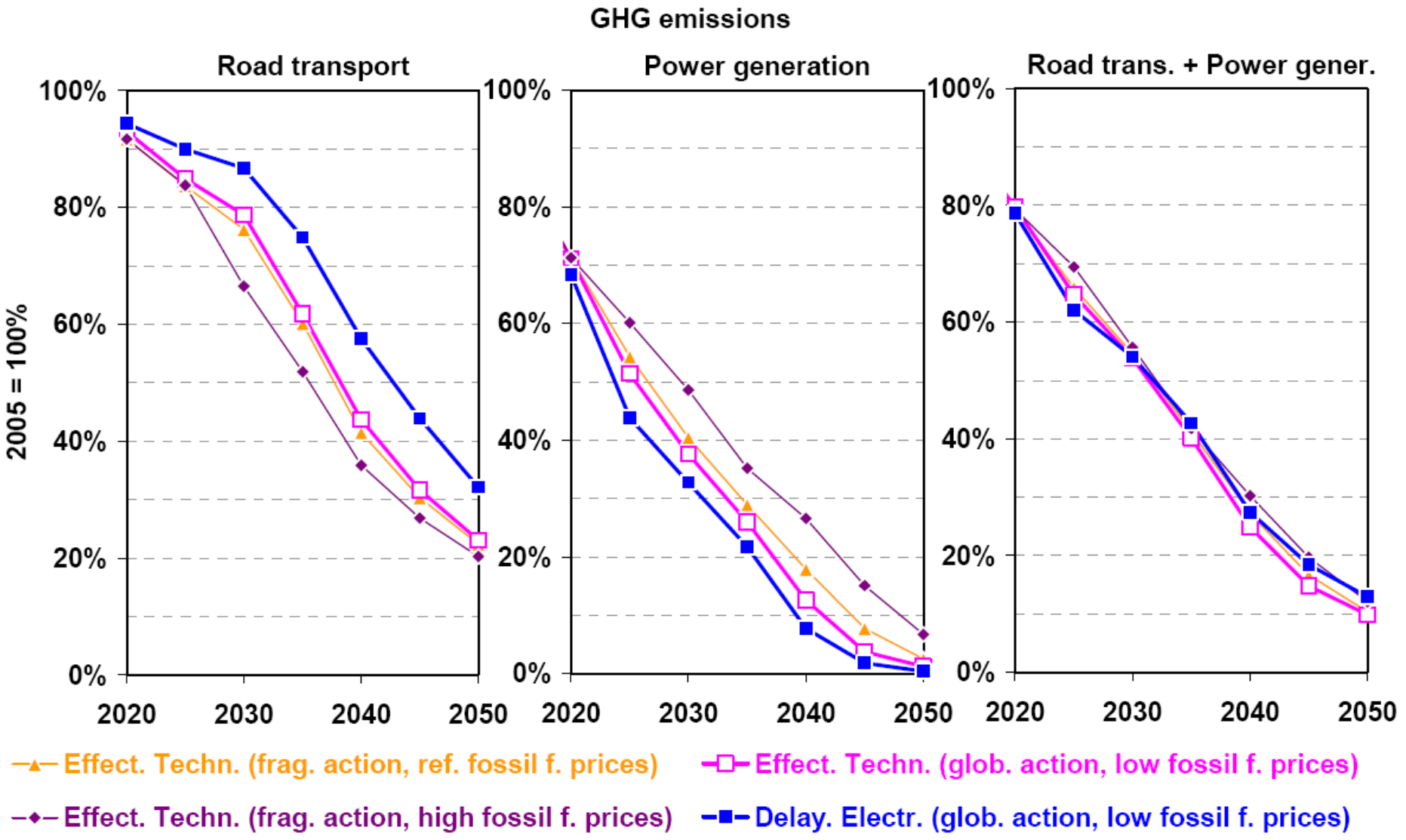

Source: PRIMES-TREMOVE modeling for *2011 Transport White Paper*

# Transport $CO_2$ emissions decomposition




Source: PRIMES modeling for EC's Impact Assessments

# Electricity




Source: PRIMES modeling for EC's Impact Assessments

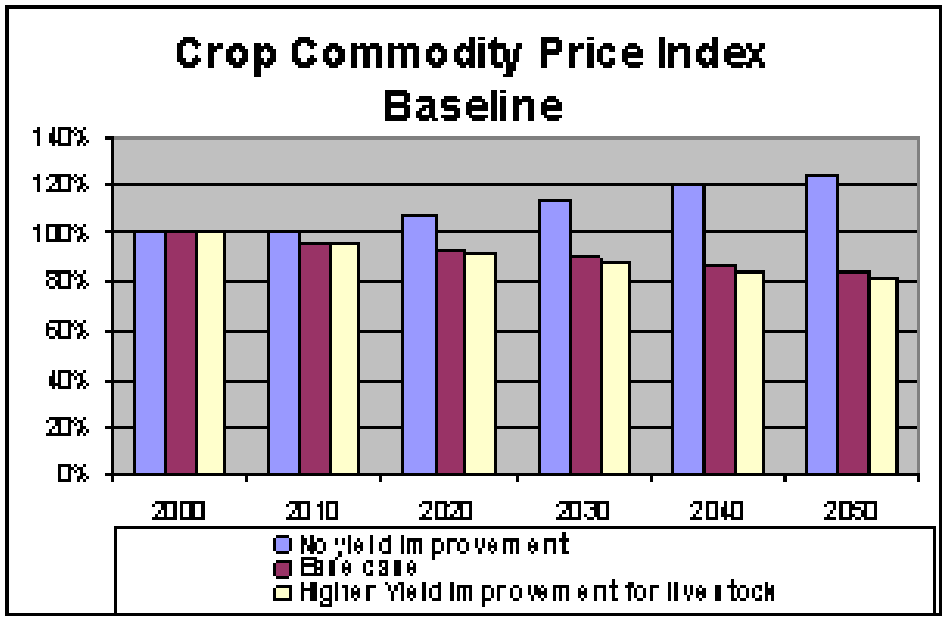
# Biofuels

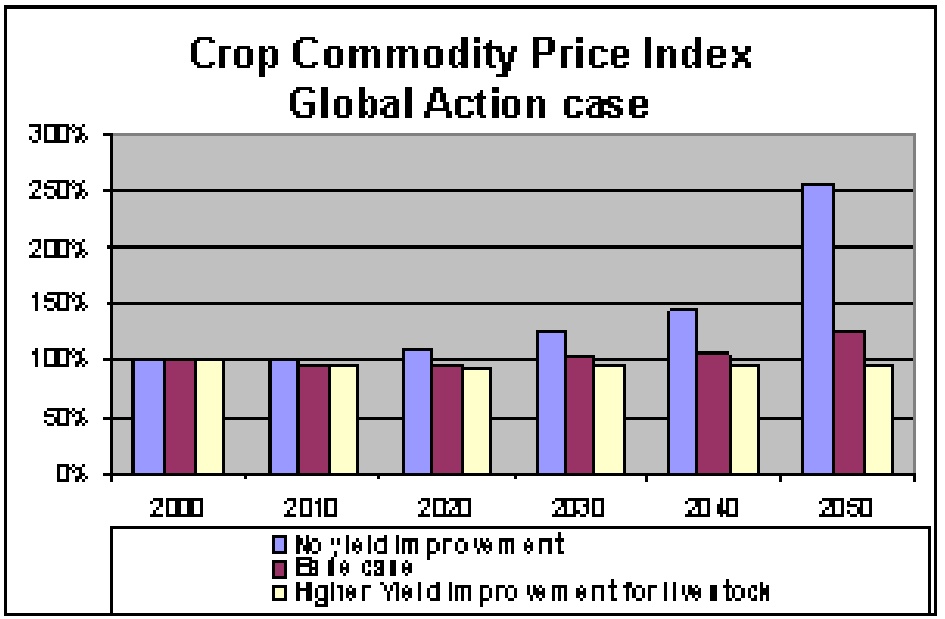
## attaining simultaneously multiple objectives

- eliminating net deforestation by 2030
- reduce (limit increase) in agricultural emissions
- increased biomass use for energy

**Reference** case: biomass production more than doubles by 2050

**Decarbonisation**: the production of biomass more than triples



# Cost & Benefits of transport decarbonization

**Table 15: Mitigation cost and co-benefit of envisaged Policy Options**

| *Policy options* | *Policy Option 2* | *Policy Option 3* | *Policy Option 4* |
|---|---|---|---|
| *Mitigation cost (€/ton CO2)* | 172 | 76 | 116 |
| *Co-benefit (€/ton CO2)* | 83 | 21 | 35 |
| *Net cost (€/ton CO2)* | 89 | 55 | 81 |

Source: PRIMES-TREMOVE transport model

# THANK YOU!

**marek.sturc@ec.europa.eu**

**http://ec.europa.eu/clima/**