

Long term mitigation objectives

VS

Short term transportation targets
in the European Union

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Conclusion 1

*A dramatic EU Factor 4 scenario
has virtually no impact on road mobility.*

*It rather induces a combination of
efficiency gains and technology switching.*

Conclusion 2

*Because of its strong inertia,
road transportation is not significantly impacted
by an F4 scenario
before 2020.*

Conclusion 3

Pre-2020 biofuel shares and gCO₂ per km are little affected by the F4 scenario.

The corresponding 2010/15/20 and 2012/20 targets are unaffectedly missed.

Outline

1. EU transportation trends and policy responses
2. Model description (in broad strokes!)
3. 2 Macroeconomic & energy scenarios
4. Road transportation in the 2 scenarios

European road transportation trends

- Sustained growth in demand
 - Overall mobility: 35 km *per cap. per day* (x2 since 1970)
 - Passenger cars: +19% pkm from 1995 to 2004,
 - Road freight: +35% tkm from 1995 to 2004
- Increased modal dominance: road accounts for 85% pkm, 44% tkm and 67% of final oil consumption
- Consequences
 - 85% of transport CO₂ (itself 28% of total emissions, +23% since 1990)
 - increasing economic costs and environmental damages

European Policy Responses 1

Transportation White Paper (2001/6)

- Statement of purpose
 - Development on 1992 white paper
 - Recognition of transport externalities beyond movement of goods/services – sustainability
 - Key objectives:
 - Maintain high mobility
 - Environment, energy supply etc.
 - Innovate in support of first two aims allowing for increased sustainability and efficiency
 - 60 EU level specific measures (13 areas), 2010 horizon, many extended to 2020.
 - Specific long term beyond the scope of the White Paper

European Policy Responses 2

Sustainable Development Strategy (2001/6)

- Transport meet society's economic, social and environmental needs & minimising neg. externalities
 - Decouple economic growth & transport demand
 - Sustainable energy use, reduce GHG and local emissions
 - Mode shares back to 1998 by 2010
- Objectives incorporated into EU policymaking
 - 2°C cap on temp increases over century over pre-industrial levels (60-80% reduction)
 - CO₂: overall and g/km with diff. type (130/10 g CO₂/km)
 - Local emissions: generalisation of EURO V/VI
 - Modal shares back to 1998 by 2010
 - Biofuels (2010: 5.75; 2020: 10%, targets as shares)

Policy update 2008

- Renewable Energy Directive Proposals (1/2008)
 - National Targets for share of RE by 2020, 20% for EU
 - Transport: 10% of final consumption of energy
 - But: need 35% GHG emissions reductions
 - Not from land with high biodiversity, carbon stock and EU raw materials must meet minimum standards
- Sept 2008 Parliament: Confirm 10% but 2015 is reduced to 5% share
- In reality targets are 4% and 6% respectively

Are these short-term objectives
implied by
the overarching long-term CO₂ target?

What are the implications of the overarching target
on road transportation?

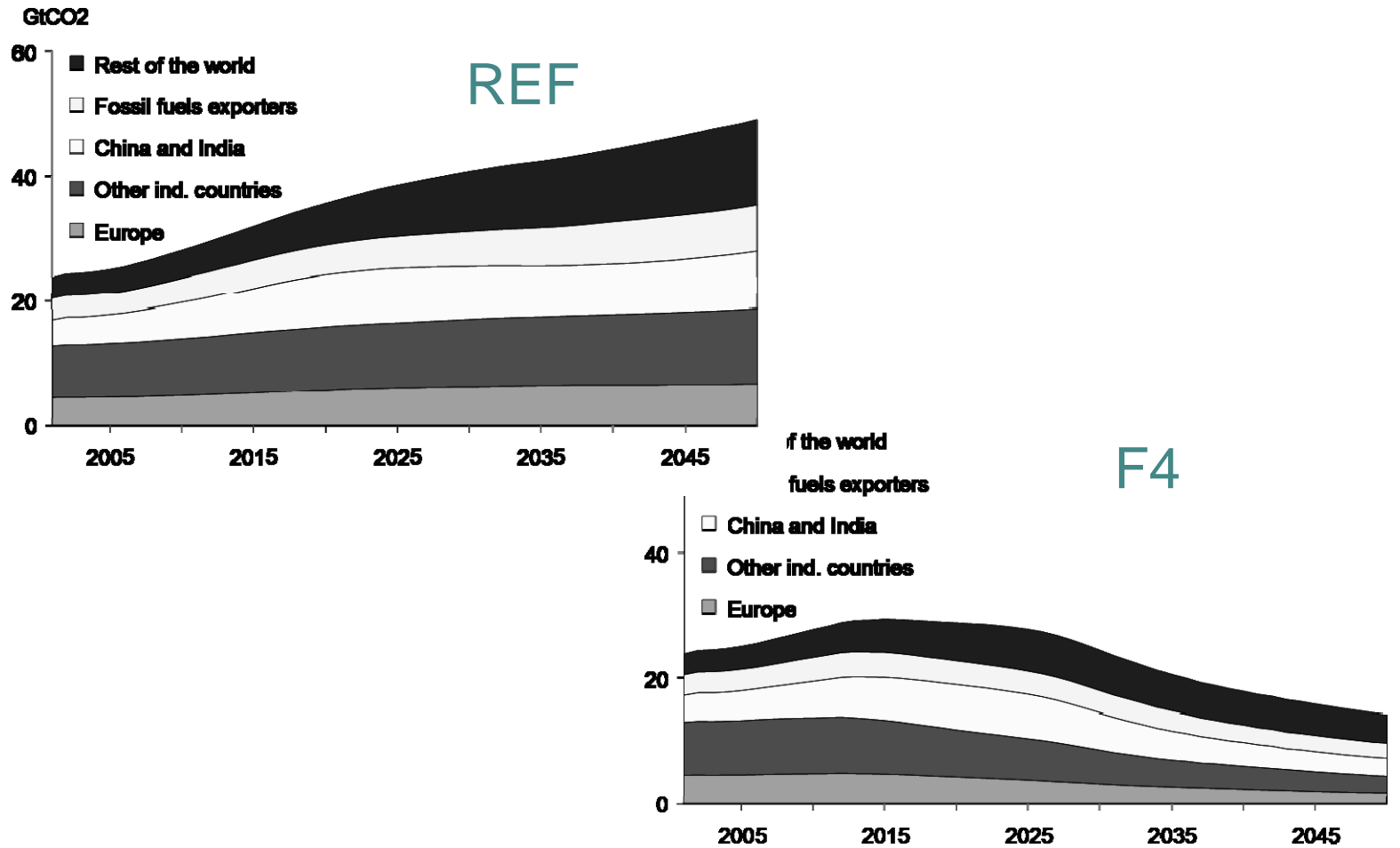
Modelling framework

- **IMACLIM-R**
 - A recursive hybrid CGE model
 - The world economy in 12 regions and 12 sectors
 - Transportation as 3 distinct sectors + a specific household modal trade-off (s.t. budget and **time constraint**)
 - Specifically dedicated to BU integration
- **POLES**
 - A recursive model of global energy systems
 - 48 reg., ca. 25 final uses, endogenous primary markets
 - Transportation: vintage car fleets, 2 other agg. fleets
- **Soft-linking through iterative convergence**

2 contrasted scenarios: REF vs F4 (450ppm)

- Reference scenario (REF)
 - Main drivers: labour productivity and demographics
 - Benchmark carbon policies (up to €30 per ton CO₂ in 2050)
 - NB: sustained European growth
- Factor 4 scenario (F4)
 - Global carbon profile compatible with 450 ppm stabilisation, close to WRE after 2010 = massive emissions reductions
 - EU 37% of 1990 levels in 2050
 - Through scaling up benchmark carbon prices

REF vs F4: emissions

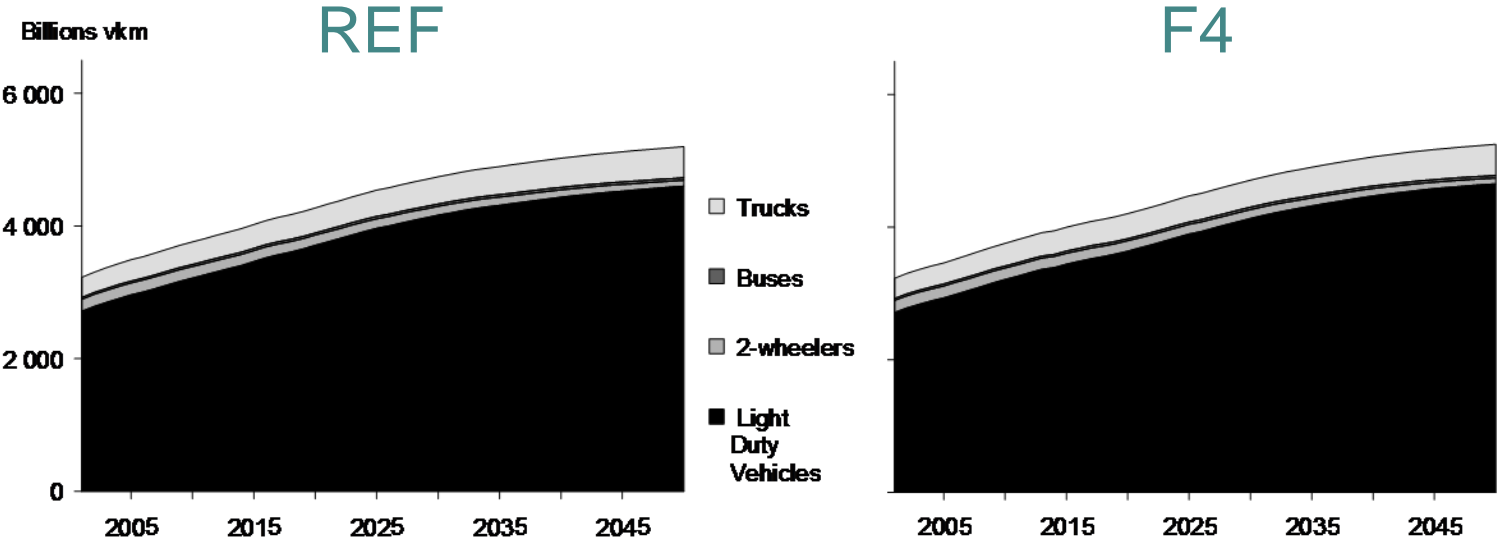


REF vs Stab450-F4: growth (av. annual GDP growth rate)

REF	2001-15	2016-30	2030-50	2001-50
Europe	2.1%	2.1%	1.4%	1.8%
Other industrialised countries	2.1%	1.8%	1.8%	1.9%
China and India	5.3%	2.3%	1.7%	2.8%
Fossil fuels exporters	4.4%	3.2%	2.3%	3.1%
Rest of the world	4.2%	3.7%	2.0%	3.1%

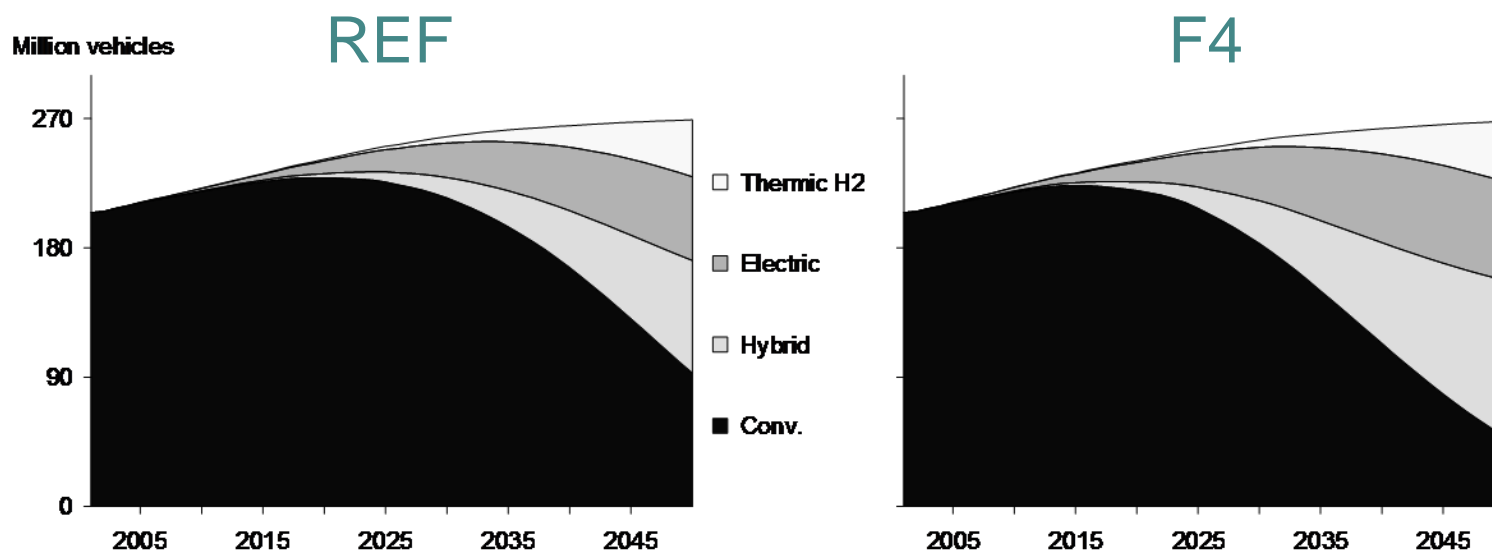
F4	2001-15	2016-30	2030-50	2001-50
Europe	1.6%	1.2%	1.4%	1.4%
Other industrialised countries	2.1%	1.5%	1.9%	1.8%
China and India	5.0%	2.3%	2.3%	3.0%
Fossil fuels exporters	4.2%	2.4%	1.8%	2.6%
Rest of the world	4.1%	3.4%	2.4%	3.1%

Total on-road mobility



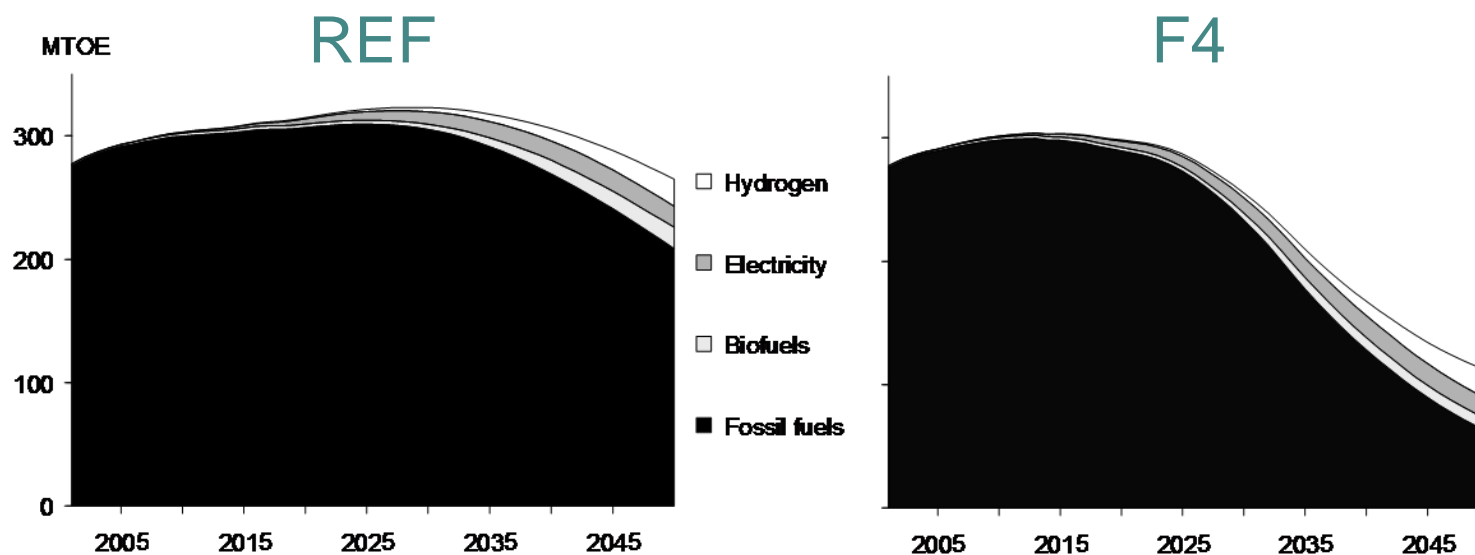
Virtually no impact on mobility!

Technology of the LDV fleet



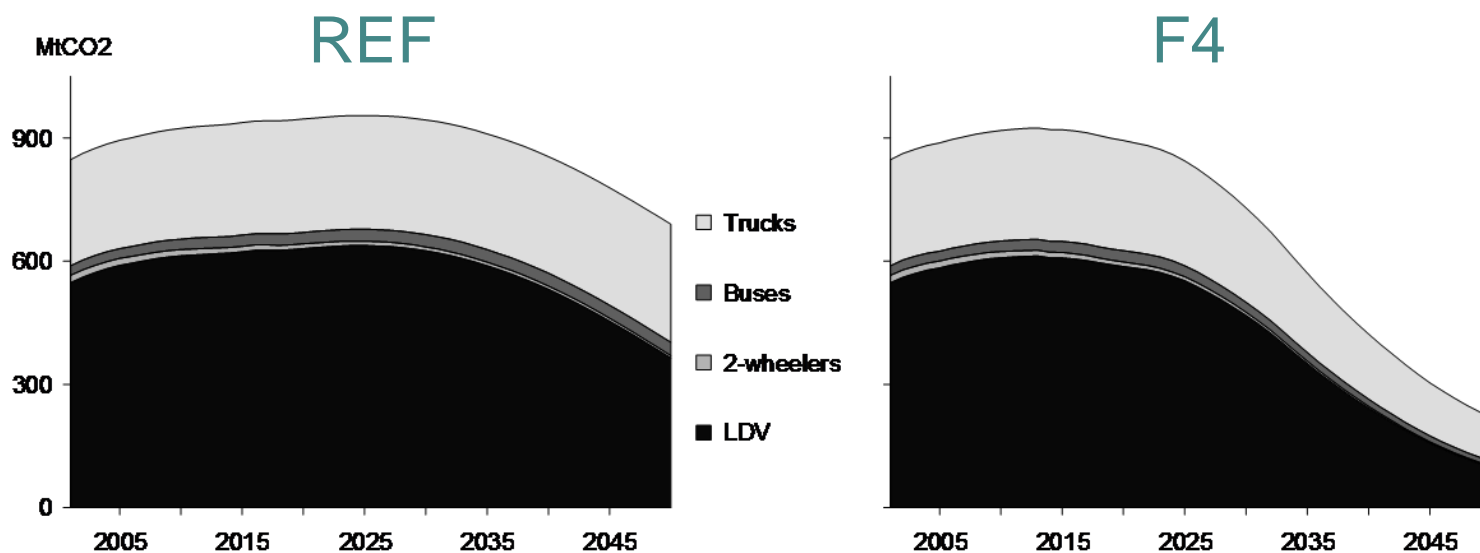
Limited technology impact, beyond 2020 only

Energy consumption



Strong efficiency gains beyond 2015

Tailpipe CO₂ emissions



As *per* the evolution of fossil fuels consumptions

Are short-term targets met?

Target	Year	Objective	REF scenario	F4 scenario
Share of biofuels	2015	5%	0.92%	0.94%
Share of biofuels	2020	10%	0.98%	1.04%
LDV CO ₂ emissions, vintage average	2012	120 g/km	148 g/km	146 g/km
LDV CO ₂ emissions, vintage average	2020	95 g/km	136 g/km	130 g/km

Targets are missed...
quite insensitive to scenario

Conclusions

- A dramatic EU F4 emissions scenario
 - Has no impact on road mobility
 - Rather, induces efficiency gains and technology switching
 - Because of low price response and fleet inertia, does not strongly impact road transportation before 2020
- 2012 to 2020 specific transportation targets are unaffectedly missed
 - Policy instruments beyond general carbon pricing are a necessity if targets are to be reached (... why?)
 - Policy initiative might induce extra costs with potentially strong impact on competitiveness