

Socially Fair Options for Effective Climate Policy

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Objective of the TransFair-AT project:

Comprehensive and innovative model-based analyses of the economic incidence and social impacts of a complete decarbonisation of the sectors residential buildings and passenger transport in Austria by 2040 under different compensation measures

→ Identification of Just Transition Pathways

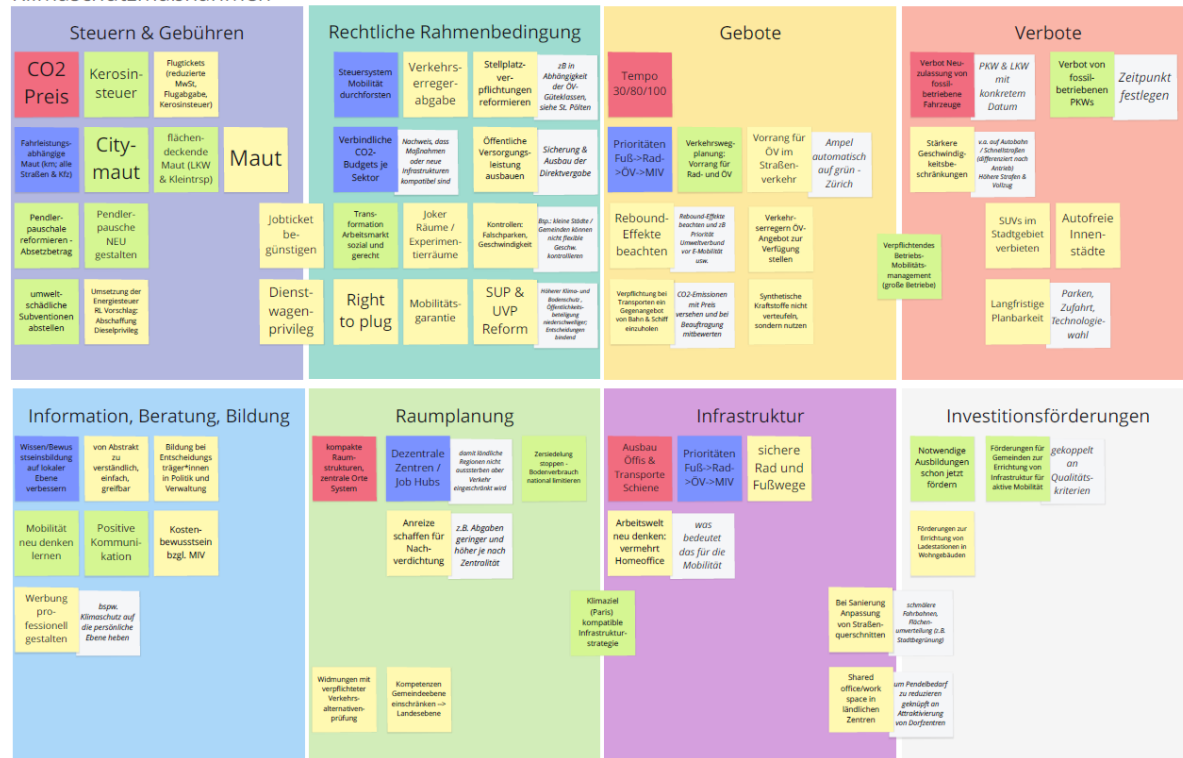
- ▶ Development of decarbonisation scenarios
- ▶ Identification of vulnerable groups
- ▶ Development of targeted compensation mechanisms to mitigate the burden of these climate policies for particularly vulnerable groups
- ▶ Iterative linking of the macroeconomic model DYNK with, the transport demand model MARS, the vehicle choice model SERAPIS, and the building stock model Invert/EE-Lab to simulate the impacts



Policy Scenarios: Decarbonization and Compensation Measures

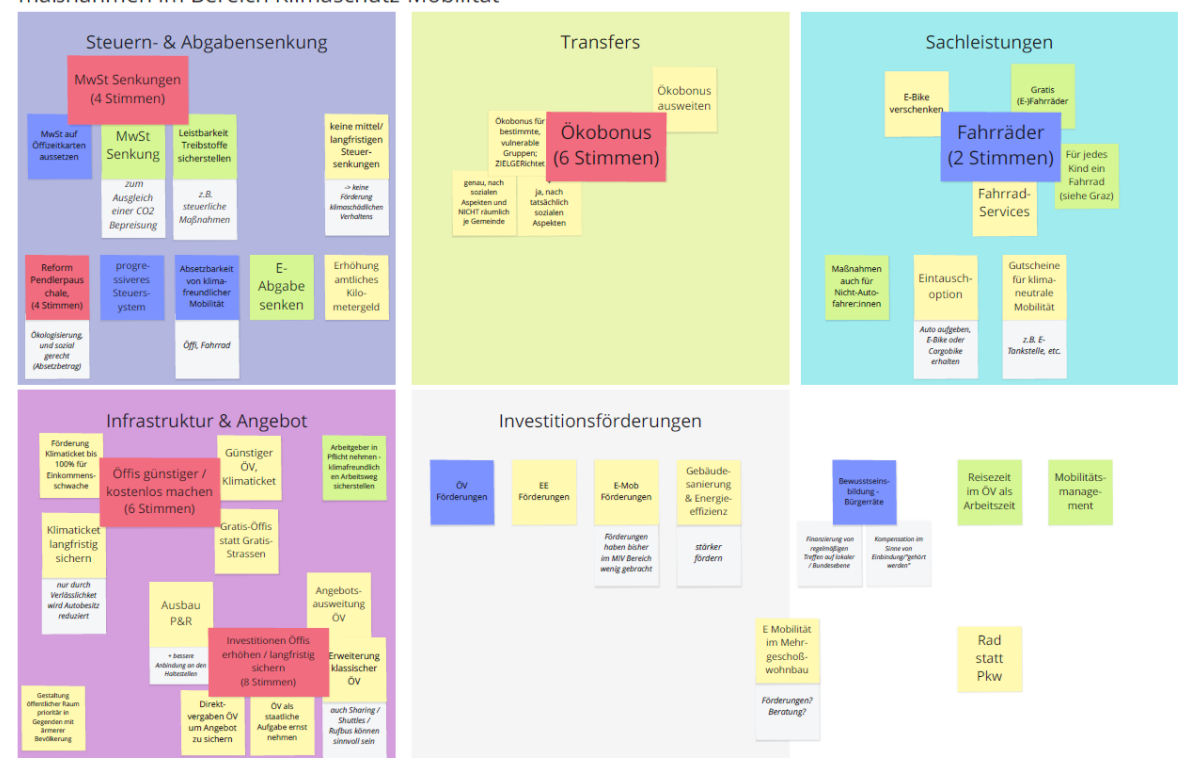
Klimaschutzmaßnahmen - Mobilität

Ergebnis der Ideensammlung für Mobilitäts-Klimaschutzmaßnahmen



Kompensationsmaßnahmen - Mobilität

Ergebnis der Ideensammlung für Kompensationsmaßnahmen im Bereich Klimaschutz-Mobilität



► Results of the 1st Stakeholder Workshop on 31/03/2022

Reference scenario (REF)*

- ▶ CO₂ price according to national pathway, flat-rate climate bonus
- ▶ Residential buildings
 - ▶ Thermal refurbishment
 - ▶ Increasing energy efficiency
 - ▶ Shift to renewable heating systems

Decarbonization scenario (CLIM)

- ▶ CO₂ price with ambitious increase, flat-rate climate bonus
- ▶ Residential buildings**
 - ▶ Regulatory policy-driven measures
 - ▶ Limited expansion of living space
 - ▶ Higher renovation and new build qualities
 - ▶ No liquid & solid fossils in new builds
 - ▶ Replacement of heating systems "out of oil and gas"
 - ▶ Operating ban on coal, heating oil (2035) and gas boilers (2040)

Compensation scenario (COMP)

- ▶ CO₂ price as in CLIM, climate bonus for Q1-Q3
- ▶ Residential buildings
 - ▶ Same assumptions as in CLIM
 - ▶ **But:** Measures driven by funding policy
 - ▶ Higher funding budgets
 - ▶ Socially differentiated subsidy rates
 - ▶ Separate funding pots for detached /two-family & multi-family houses
 - ▶ Stringent examination of alternatives in the event of a heating system change

* Based on With Existing Measures (WEM) Scenario of the Federal Environment Agency (2023)

** Based on With Additional Measures (WAM) Scenario of the Federal Environment Agency (2023)

Reference scenario (REF)*

► Mobility

- Promoting electromobility and increasing vehicle efficiency (CO₂ fleet targets for cars and LNF EU)
- Use of biofuels in transport
- Promotion of active mobility and mobility management

Decarbonization scenario (CLIM)

► Mobility

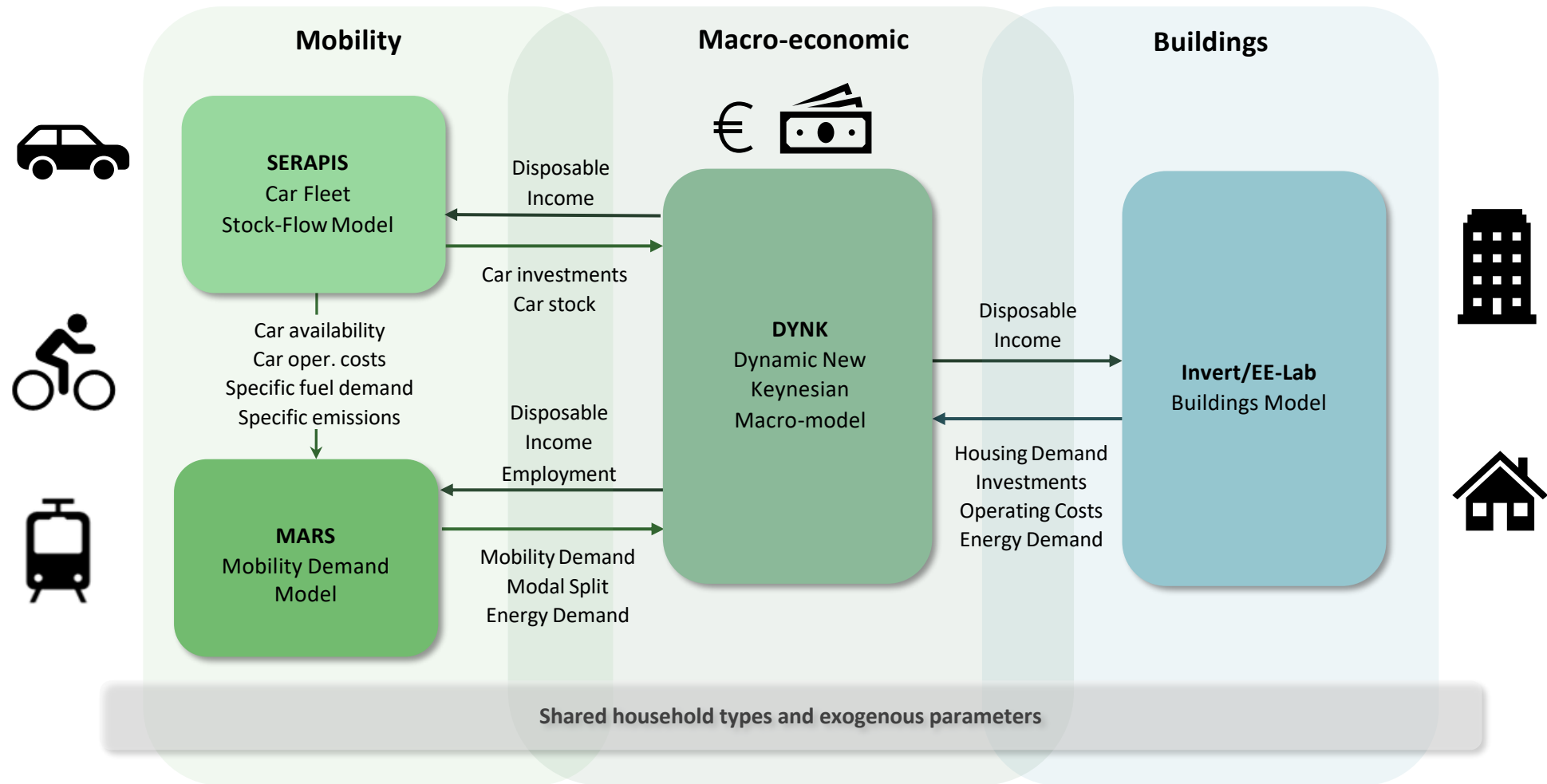
- Improvement of public transport & non-motorized individual transport services
- Introduction of a distance-based road toll
- Mineral oil tax (MÖSt) increase by 50% in both 2025 and 2030
- Expansion and increase of parking fees
- Greening of commuter allowance
- Share of BEV increases to 88% by 2040

Compensation scenario (COMP)

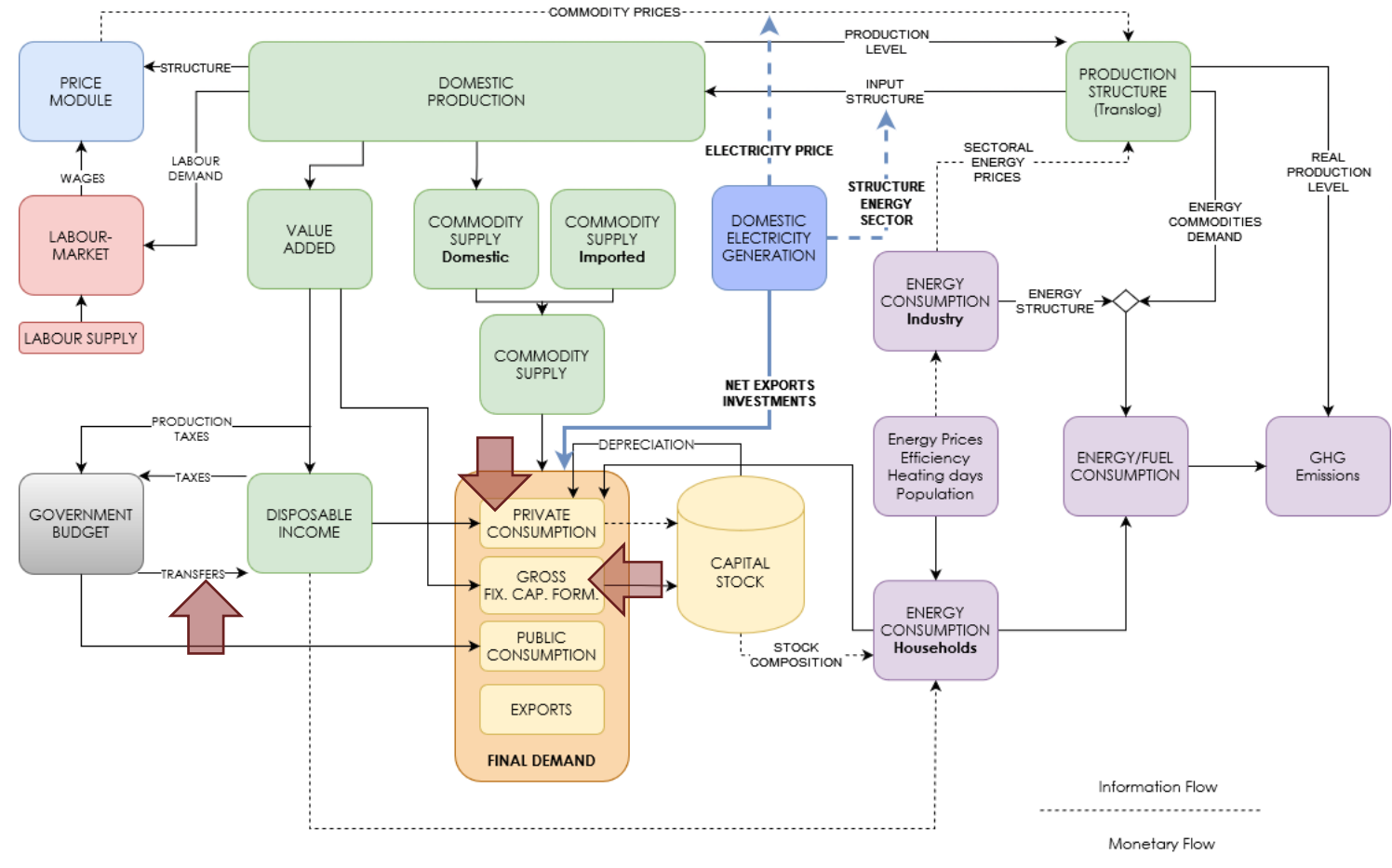
► Mobility

- Same assumptions as in CLIM
- Restriction of commuter allowance to Q1 to Q3
- 50% reduction of the public transport ticket price

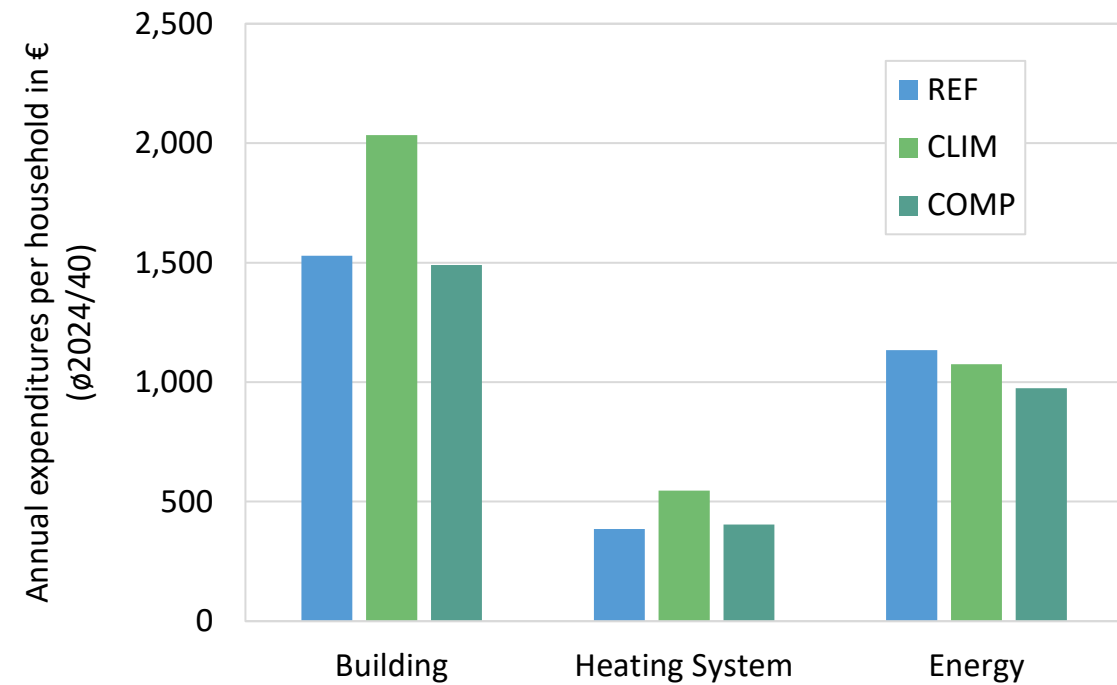
* Based on With Existing Measures (WEM) Scenario of the Federal Environment Agency (2023)

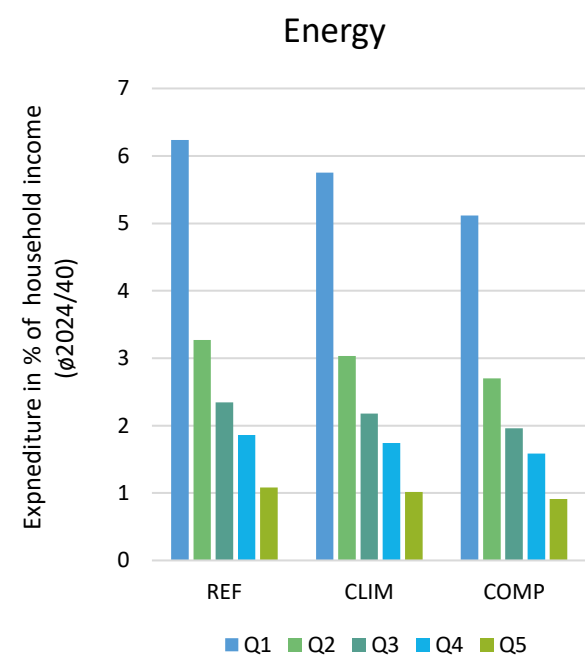
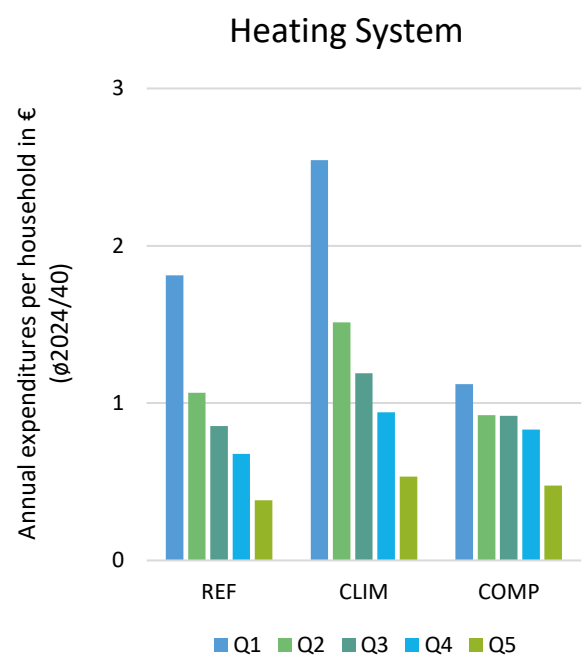
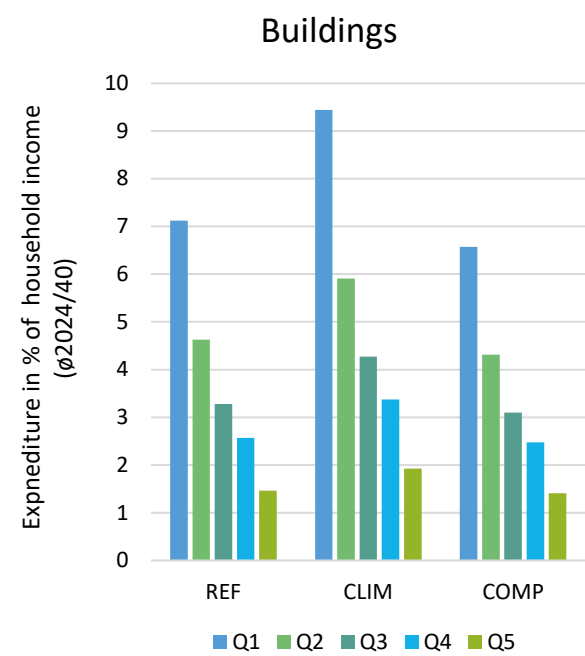


- ▶ Macroeconomic Model (IO-based)
- ▶ Flexible household groups (up to 250)
- ▶ Modular structure
 - ▶ Goods market
 - ▶ Final demand
 - ▶ Price system
 - ▶ Labour market
 - ▶ Energy demand (physical/monetary)
 - ▶ CO₂ emissions
 - ▶ Electricity generation module
 - ▶ State budget
- ▶ Entry points for bottom-up Models

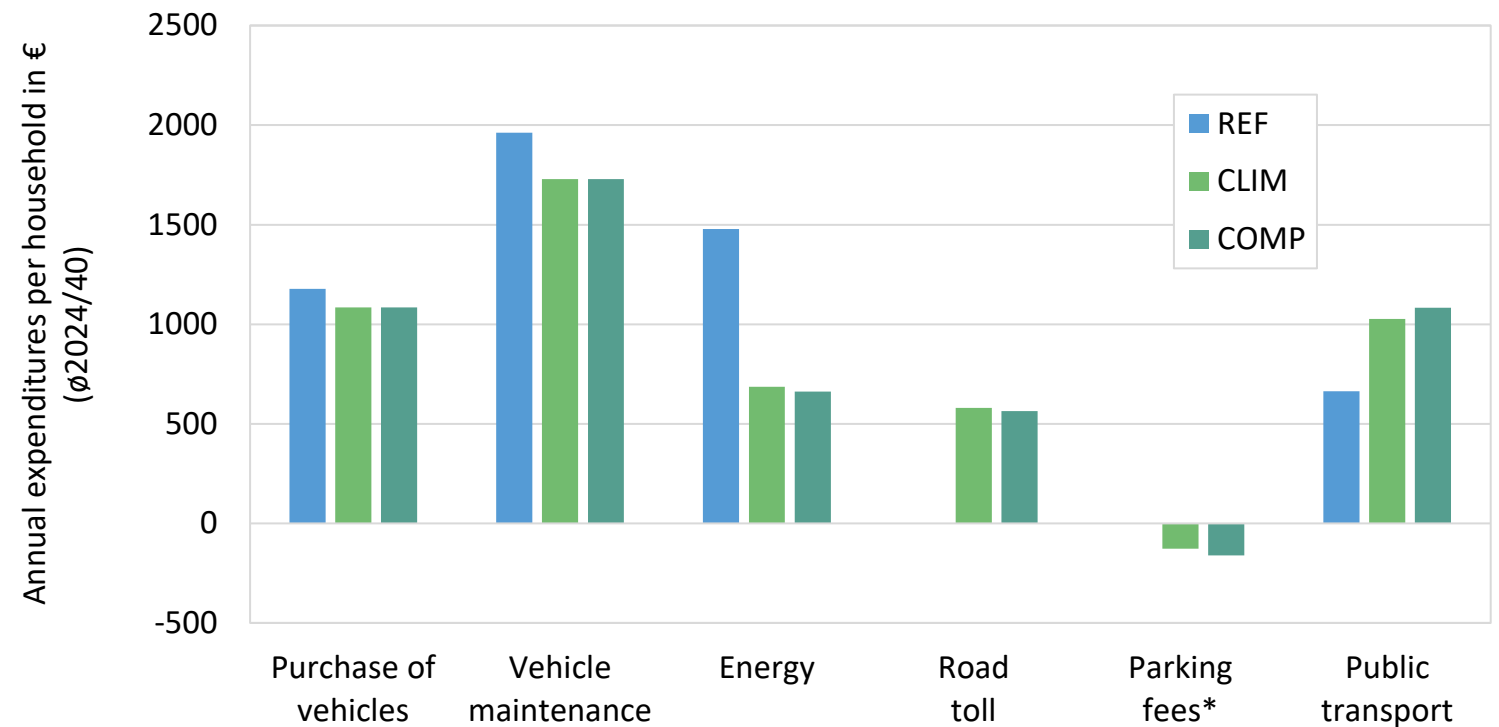


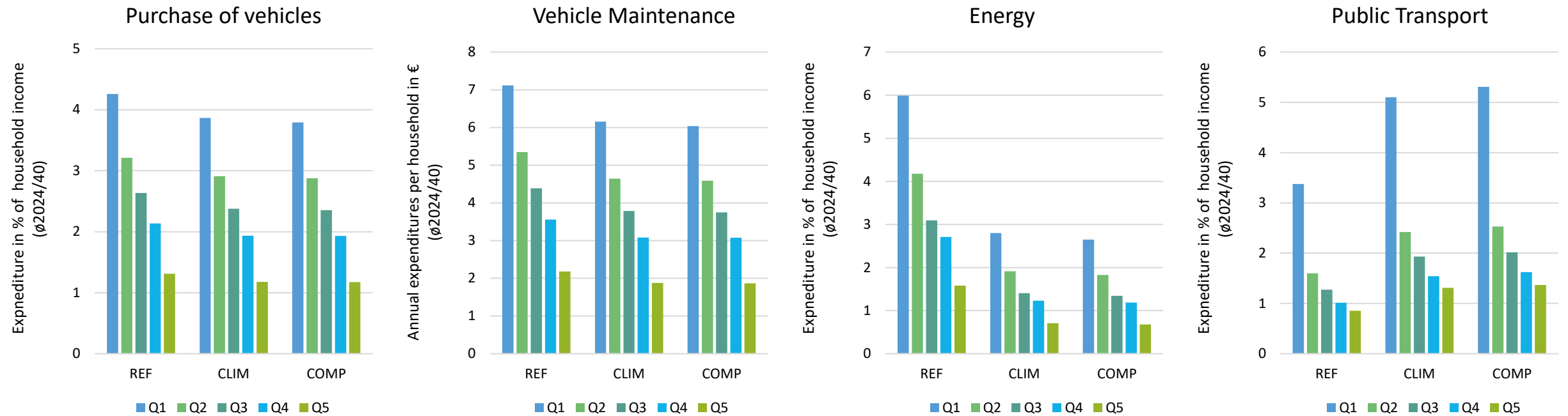
1. Investment in thermal refurbishment & building maintenance (excl. subsidies)
2. Investment in heating systems (excl. subsidies)
3. Heating energy costs





1. Purchase of vehicles
2. Vehicle maintenance
3. Energy costs (fuel & electricity)
4. Mileage-based tolls
5. Parking fees (*Delta to REF)
6. Public transportation expenses





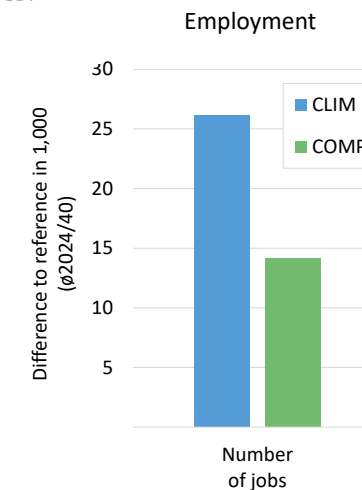
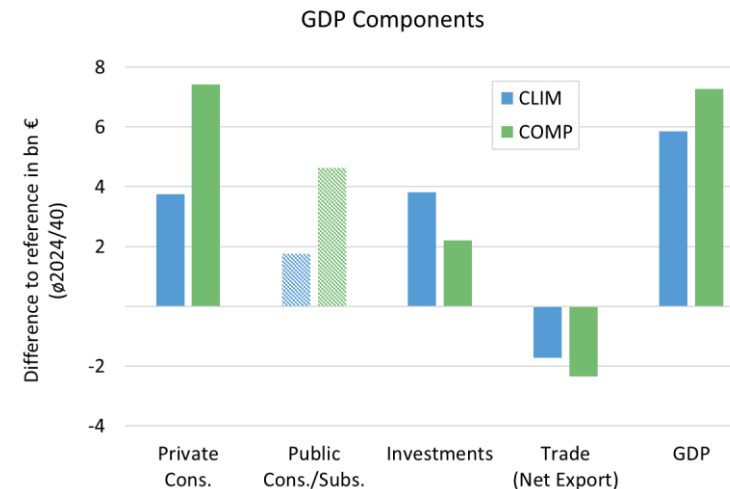
Average changes (2024/40 vs REF)

► GDP

- Private consumption increases
 - higher economic activity (investments)
 - cheaper products (public transport)
- Public consumption (including new subsidies) increases
- Investments
 - Refurbishment activities
 - Induced investments (public transport)
- Rising imports
 - Due to investments and consumption ; Exports are fixed
- GDP level increases by 1.3% (**CLIM**) or 1.6% (**COMP**) compared to reference

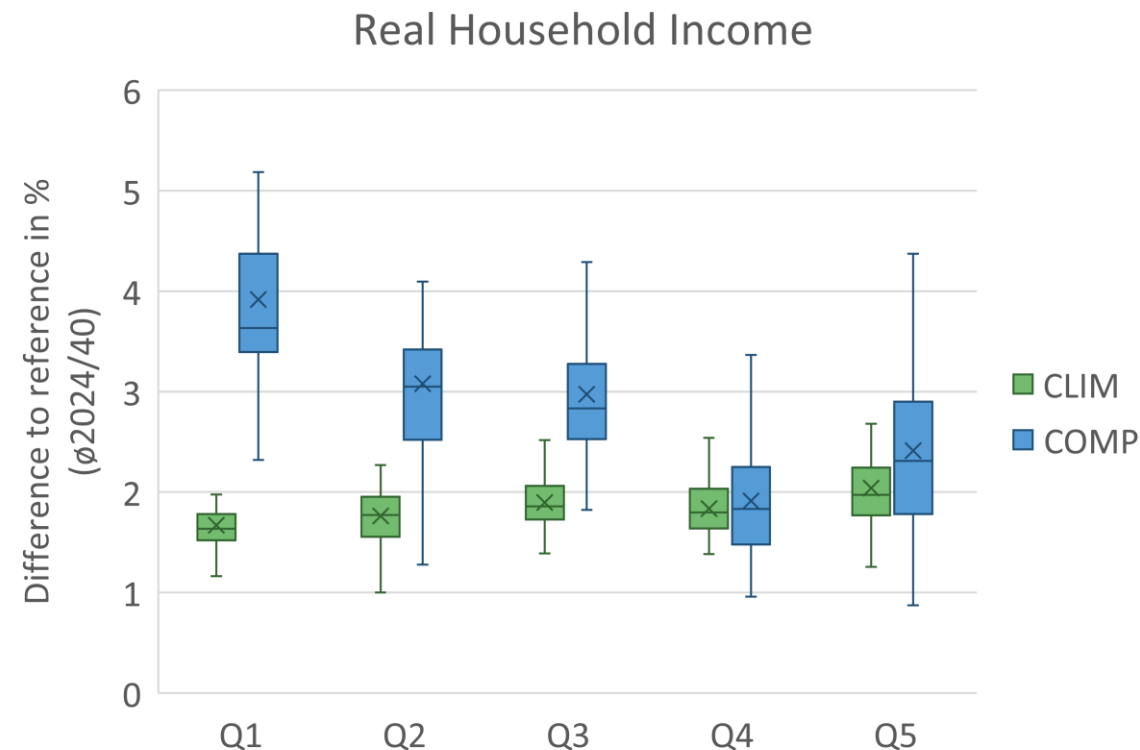
► Employment

- Investments in **CLIM** → production and construction services
- Higher subsidies and less Investment in **COMP**



Average changes (2024/40 vs REF)

- ▶ Real household income increases in all income quintiles in **CLIM** and **COMP**
- ▶ In **CLIM**, gains increase with household income
- ▶ **COMP** results in higher gains for lower incomes
 - ▶ Q5 surpasses Q4 due to increases in income from profits
 - ▶ Strong variation within income quintiles due to heterogenous household characteristics and consumption structure



Average changes (2024/40 vs REF)

► Public income

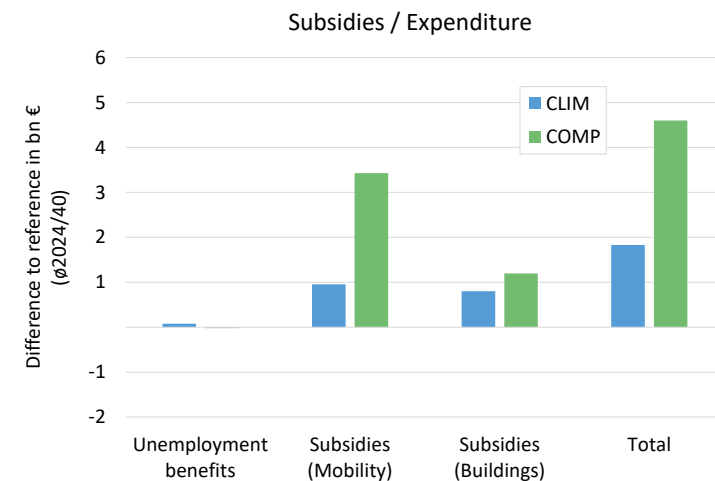
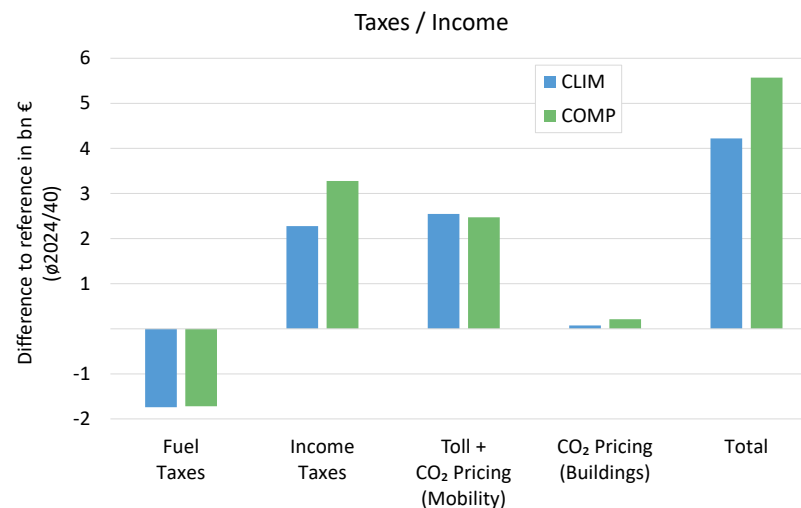
- Fuel tax revenues (MÖSt) decrease
- Income tax & social security contributions increase
- CO₂ tax revenues from transport and buildings increase
- Additional revenues from road toll

► Public spending

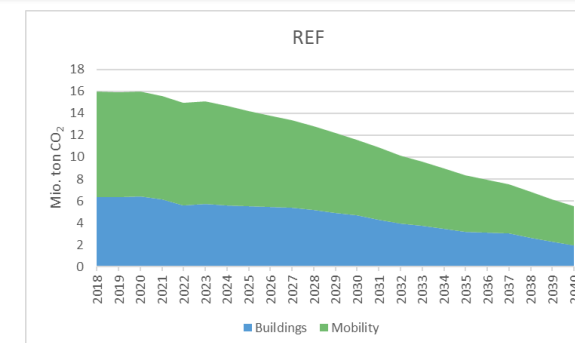
- Unemployment benefits decrease
- Support of public transport increases
- Subsidies for renovation & exchange of heating systems

► Balance

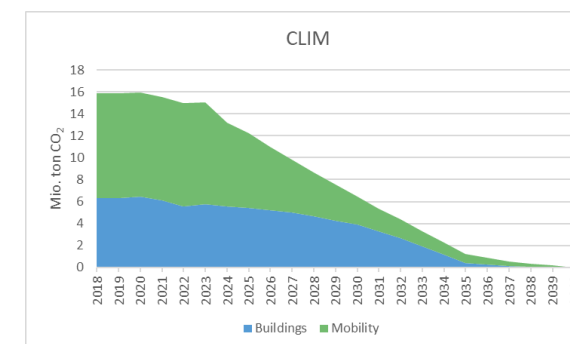
- Surplus is used up in **COMP**



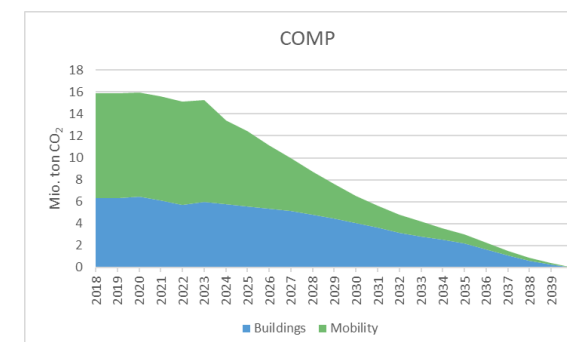
- REF: ~5.5 Mt CO₂ remain in 2040 due to trends set in REF



- CLIM: Measures lead to strong decrease until 2035



- COMP: Fade-out until 2040



- ▶ Decarbonisation of mobility and housing 2040 is possible with a comprehensive mix of policy measures
- ▶ Climate policies come with positive macroeconomic impacts and increases in household incomes
- ▶ Without additional compensation measures, climate policies result in stronger gains for higher income groups
 - ▶ Differences between income groups increase
- ▶ Compensation measures (e.g. limiting climate bonus payments and commuting subsidies to Q1-Q3, higher subsidies for lower incomes) result in stronger gains for low-income groups and a more equal distribution
- ▶ **Just Transition Pathways can be achieved**

Thank you for your attention!

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