

DECARBONISING THE SWEDISH ROAD TRANSPORT SECTOR

- Ann-Charlotte Mellquist
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20-FIFTY

INTRODUCTION

■ Background Sweden

- 1/3 of CO₂ emissions originates from transport sector
- 80% of oil consumption is due to road transport
- Political agreement on goals:
 - Reduce CO₂ impact from transport sector by 70% to 2030
 - Fossil fuel independency by 2045

■ Project

- “Macroeconomic effects of a fossil fuel independent vehicle fleet in Sweden” - 20-Fifty
- Explores different vehicle stock pathways and their effects on the Swedish economy

- Ann-Charlotte Mellquist
 - MBA International Finance
 - MBA Innovation, Enterprise and Circular Economy
- Researcher at RISE Viktoria
- RISE Research Institutes of Sweden

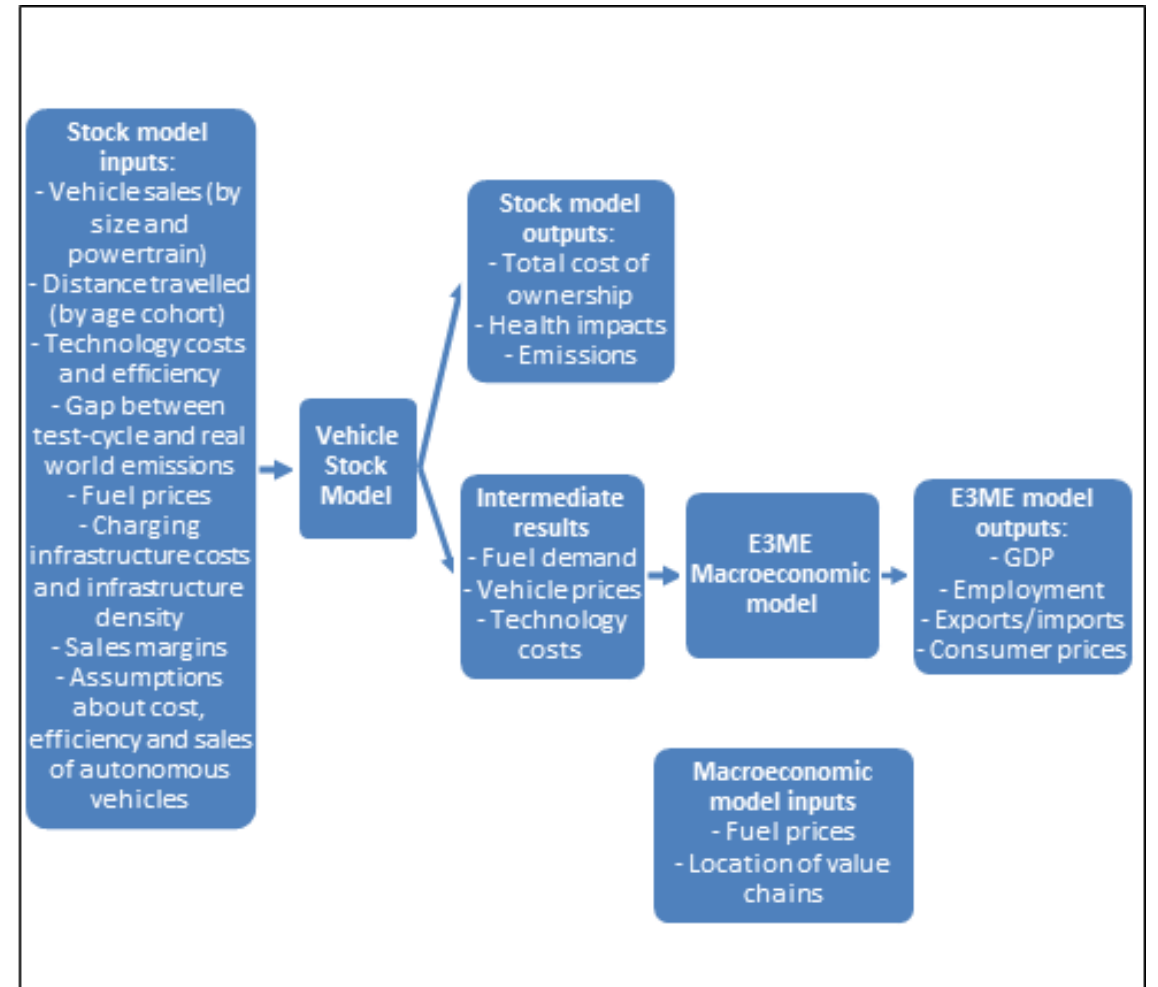
MODELS

■ Vehicle Stock Model

- Partial model based on annual vehicle cohort
- Includes passenger cars, buses and freight vehicles
- Assumptions on future development of technology, power trains and fuel types

■ E3ME

- Econometric (non-equilibrium) model
- Input-Output model
- Complete integration of energy and economy modules
- 53 regions, 77 economic sectors



Ann-Charlotte Mellquist

APPROACH AND SCENARIOS

■ Approach

- Technology and power train assumptions acc to assessments of Swedish situation
- Top up of drop in biofuels to meet the goals

■ Scenarios

Name	Description	Biofuel demand 2030
CPI	Current Policy Initiative (baseline – does not meet targets)	small
BIO	Biofuel based	43 TWh
ELEC	Battery electric based	23 TWh
FCV	Fuel cell based	22 TWh

Goal:

- To meet the decided emission targets (80% reduction of CO₂ from road transport until 2030)

Ecologically sustainable available biomass in Sweden:

- 10 - 35 TWh/yr (2030 - 2050)

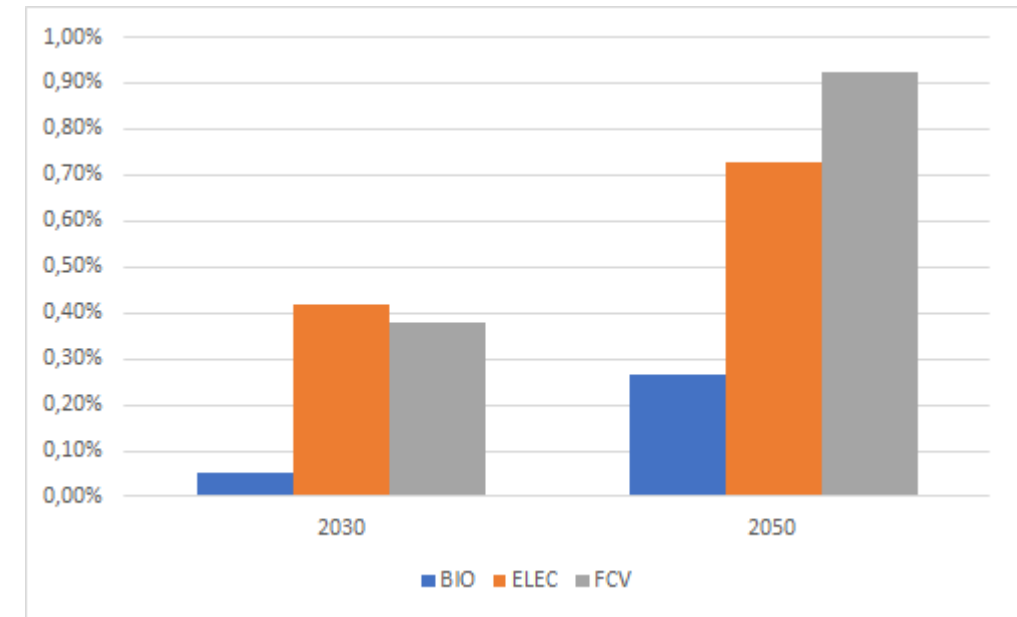
MACROECONOMIC FINDINGS

■ Results

- GDP, Employment, Consumer expenditure, Investments – all positive
- Imports increase
- ELEC and FCV substantially more positive than BIO
- FCV slightly more positive than ELEC, in the long run

■ Rational

- Imported fossil fuels replaced by domestically produced fuels
- Increase in consumer expenditure
- Increasing investments in new infrastructure
- Imports of advanced technology increase and imports increase from increased economic activity



GDP – relative difference to CPI

CONCLUSIONS

- Rapid uptake of technology and advanced powertrains is needed
- Drop in biofuels are needed – to impact current stock of vehicles
- Behavioural shifts are outside the model, but would greatly help the transition

- The targets can be met!
- And it can be positive for the Swedish economy
- Action is needed now!

FUTURE WORK

- Within the project

- Add Mobility as a Service - car sharing and autonomous vehicles
- Explore lower FCV deployment in HGV:s
- Explore oil price sensitivities (downward)
- Different domestic biofuel production capacity levels

- Potential next steps

- Add Electric Roads
- Explore pure biofuels in addition to drop in fuels

- Similar study in Germany

THANK YOU!

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Ann-Charlotte Mellquist
ann-charlotte.mellquist@ri.se
Tel: +46 702 656560

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