



What policies are necessary for achieving a resource efficient economy in Europe in 2050: Modelling results

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Martin Distelkamp¹**

Co-Authors: Bernd Meyer¹, Mark Meyer¹ and Tim Beringer²

¹ GWS Osnabrück, Germany

² IASS Potsdam, Germany

Davos

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Background

The model and the scenarios

Background

► The GINFORS model

⇒ GINFORS = global dynamic EE-MRIO

⇒ Coverage and degree of detail of current version 3:

- 38 countries + region „Rest of World“
- 59 product groups, 35 industries, 27 energy carriers, 7 raw materials, 13 crop groups, 4 water abstraction sectors
- National sector accounts with more than 100 posting items

⇒ Theoretical foundation: Neo-Keynesian

⇒ Empirical foundation:

- WIOD as main database
- Behavioural parameters derived by econometric analysis

► In POLFREE linked with LPJmL

⇒ Global bio-physical model by PIK, that projects crop growth

Background

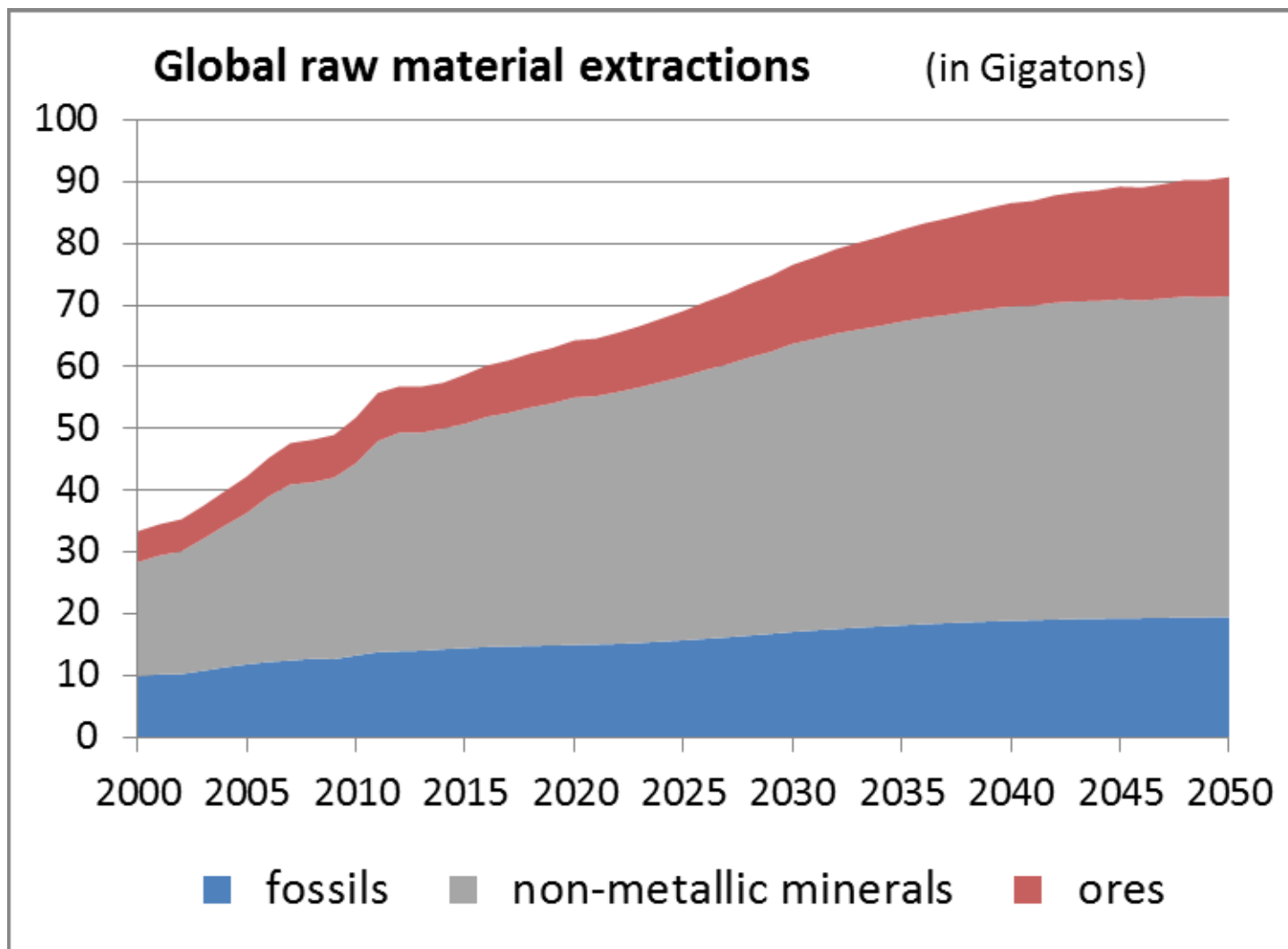
The Scenarios (up to 2050)

- ▶ A **Reference Scenario** that shows a plausible pathway, if technology and behaviour continues to change like in the past and (environmental) policy does not change.
- ▶ Three transition scenarios **Global Cooperation**, **EU Goes Ahead** and **Civil Society Leads** that ask for policy measures and behavioural changes that are needed for an simultaneous achievement of key environmental targets for the EU
 - ⇒ GHG emissions reduced by > 80% (compared to 1990)
 - ⇒ RMC per capita reduced to less than 5 tons
 - ⇒ Crop land footprint per capita reduced by > 30%
 - ⇒ Water exploitation indices below 20%



Key findings

The development up to 2050 in the Reference scenario



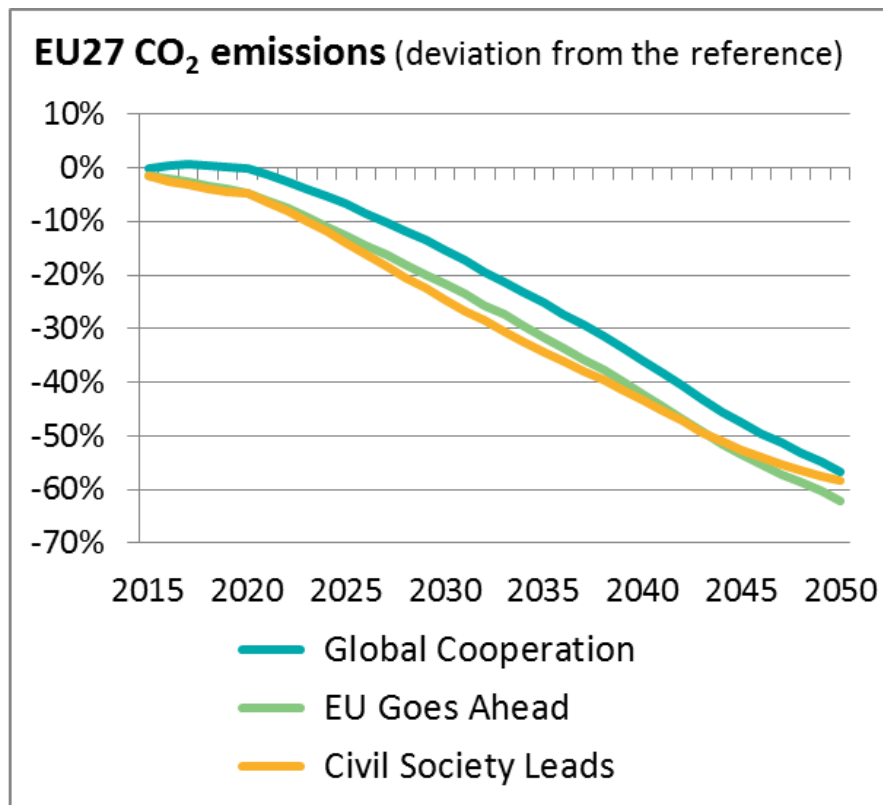
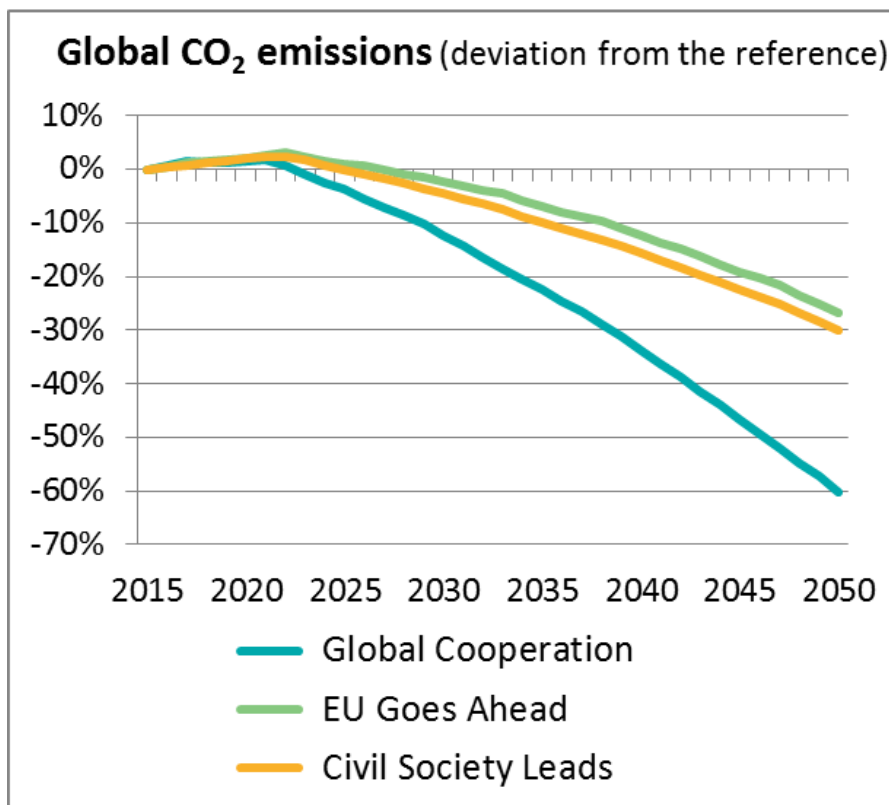
- ▶ What else?
 - ⇒ Global CO₂-emissions climb up to 45 Gigatons, which means that the world is on a RCP6.0 pathway
 - ⇒ Global agricultural land increases by more than 3.9 mio. km² (nearly halve the size of Brazil) within the next 35 years
 - Ongoing deforestation and biodiversity losses
 - ⇒ Further increase of global water abstraction (+5%)
 - Ongoing/increasing pressure on freshwater resources
 - ⇒ Global crop demand for food, feed and processing purposes increases faster than crop production
 - Accelerating crop prices with negative impacts on poverty and famine abolishment
 - ⇒ and from a EU27 perspective: despite demographic change ongoing unemployment problems



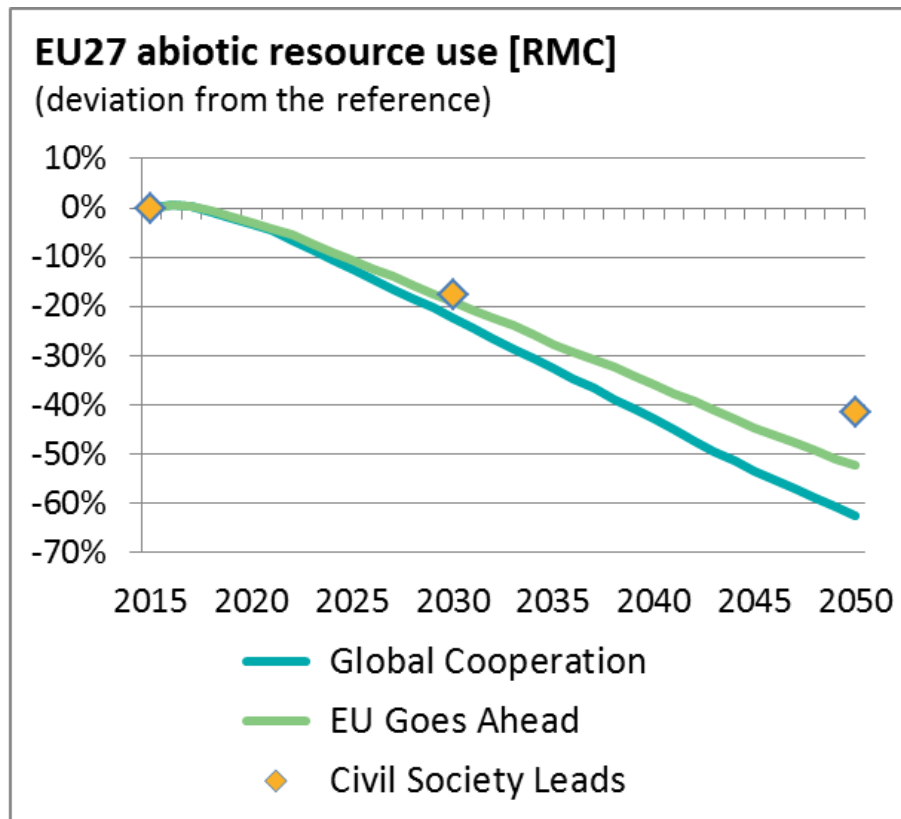
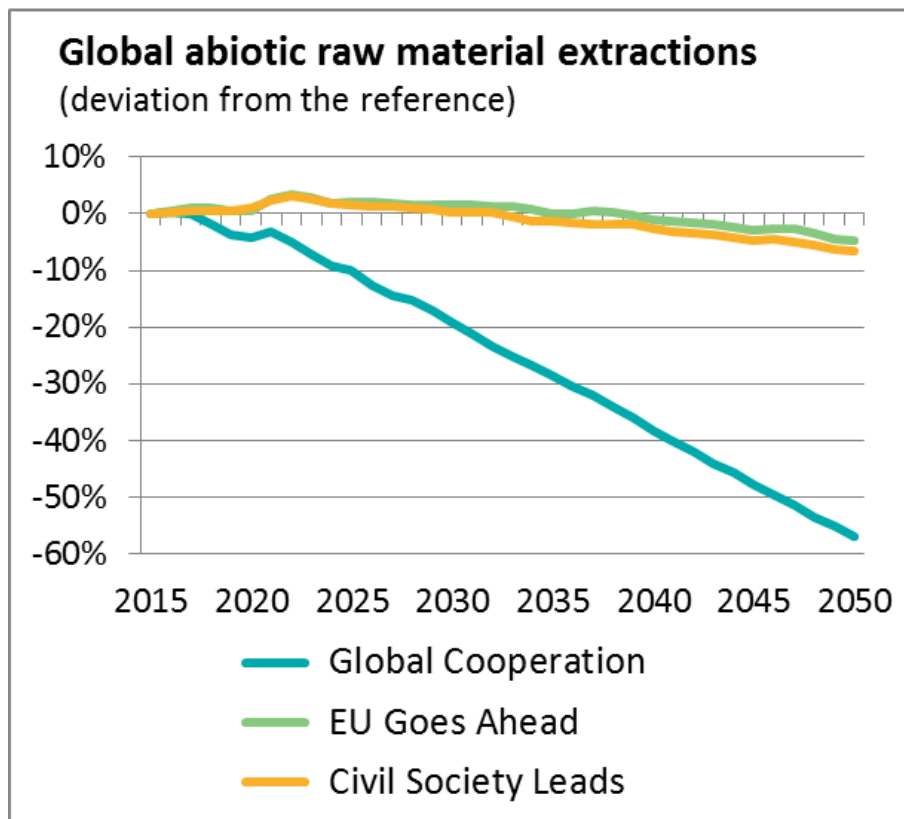
Key findings

The policy impacts in the transition scenarios

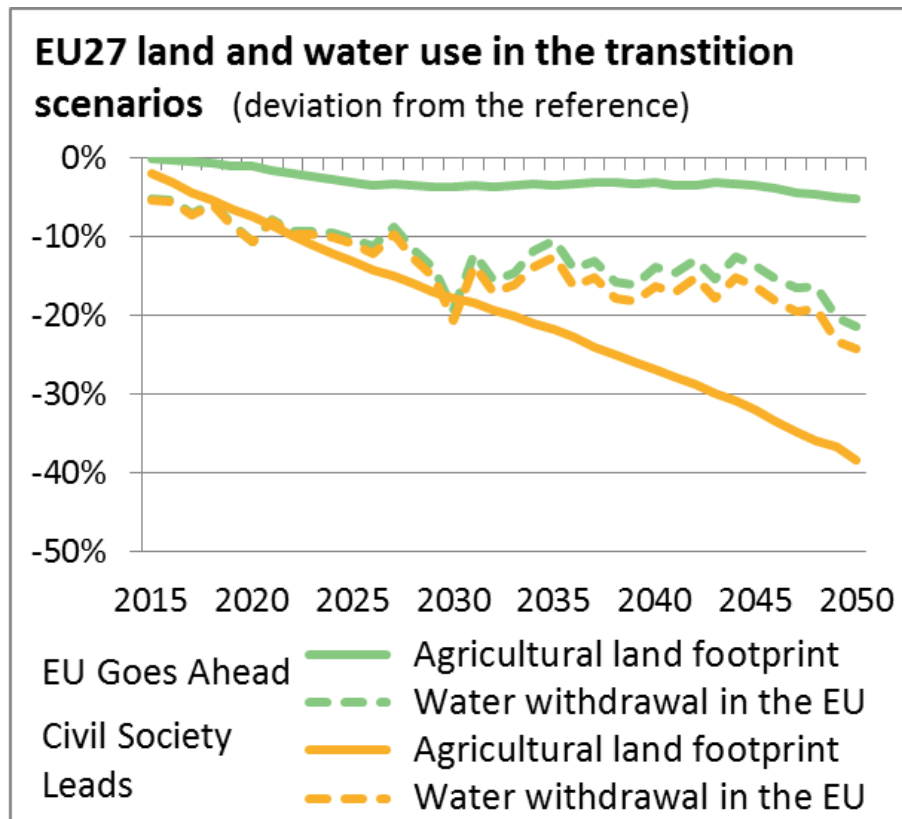
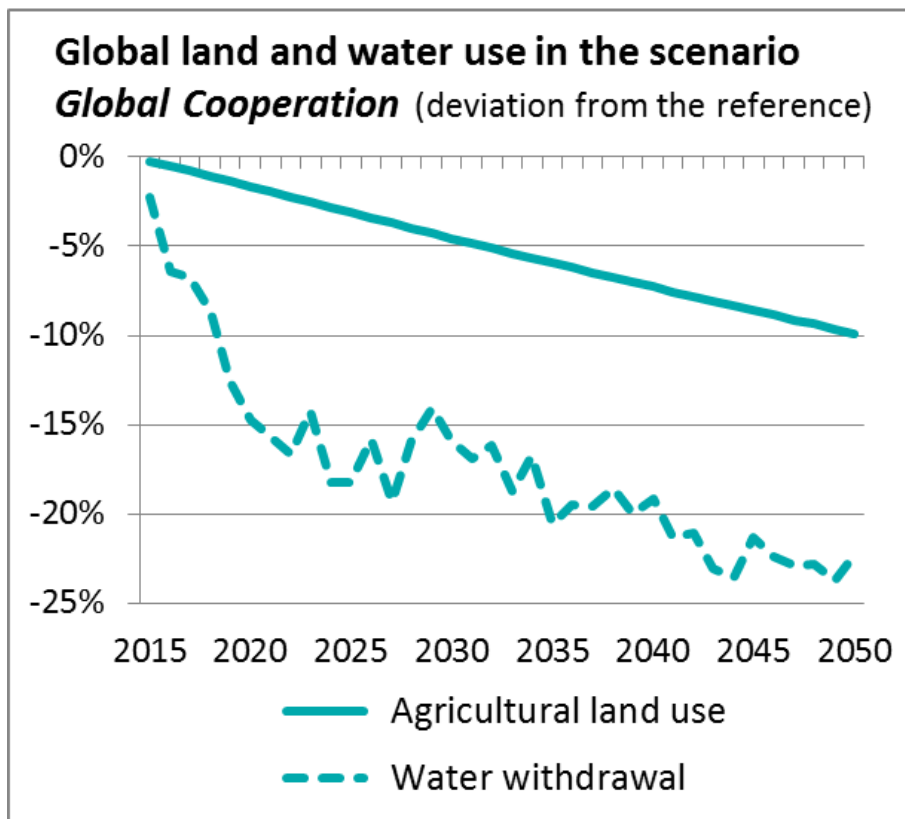
► Carbon



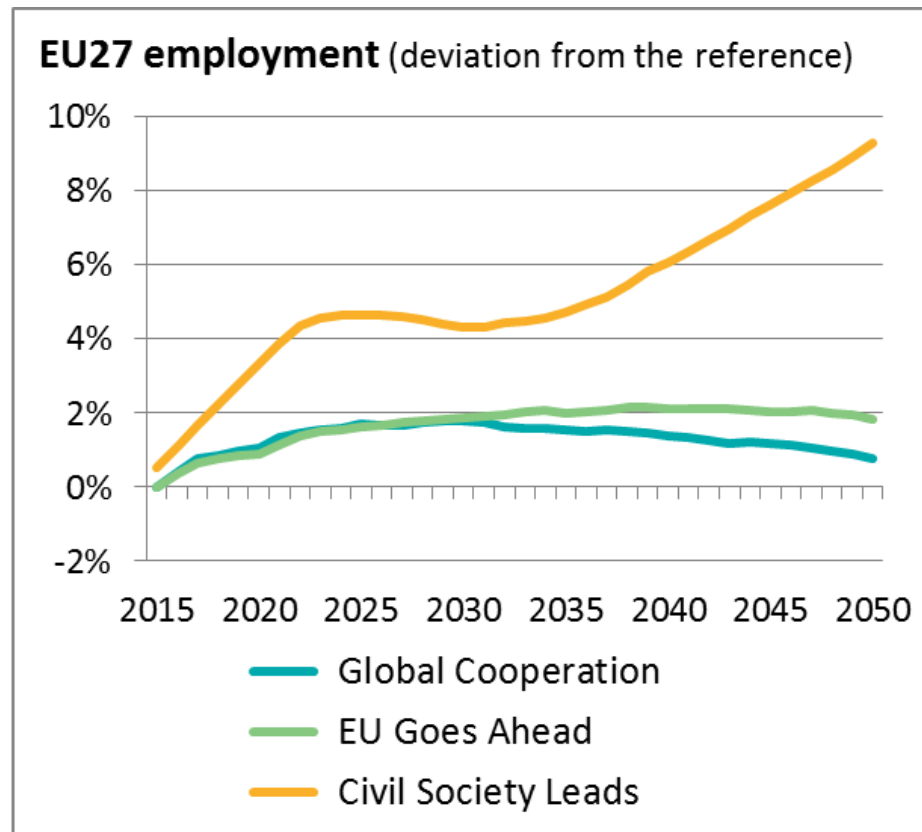
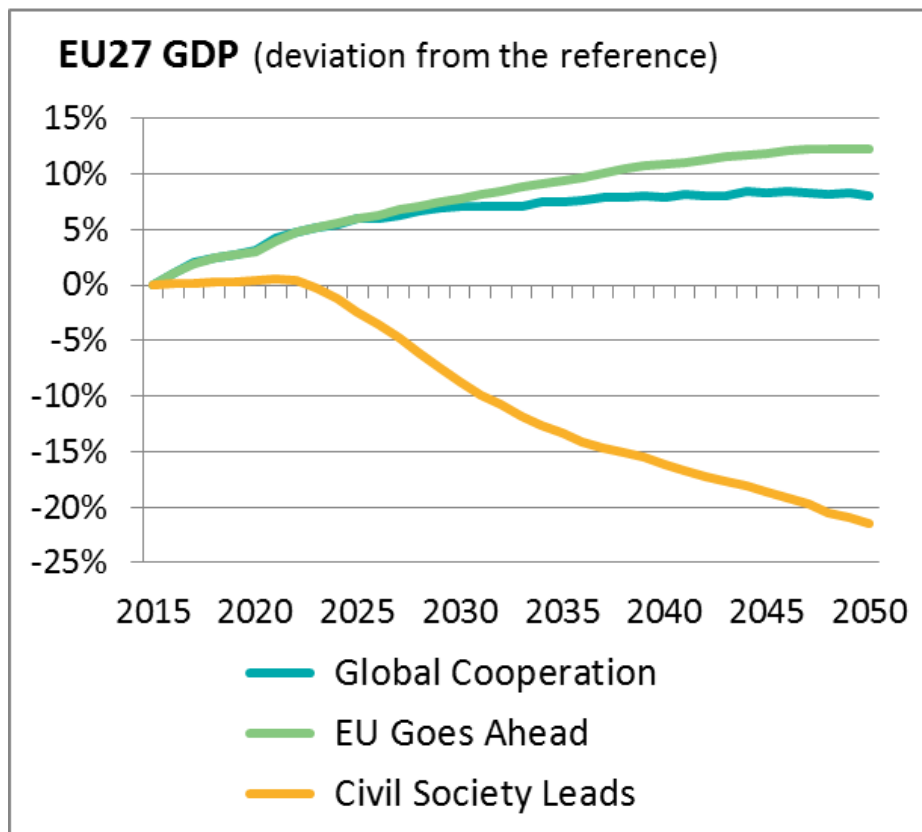
► Abiotic raw materials



► Land & Water



► Impact on jobs and growth in the EU



- ▶ Achievement of environmental targets is possible,
- ▶ but only with a clear and comprehensive policy intervention that targets at resource efficiency advances in industry as well as at resource use reductions by citizens
- ▶ Modelling of policy measures and behavioural changes in POLFREE based on elaborated research by WI
 - ⇒ In each of the three transition scenarios a set of 20 to 30 single policy measures / behavioural changes is considered

- ▶ What policies are necessary for achieving a resource efficient economy in Europe in 2050?

1. Set the prices right

- Examples: ETR / ETS; fade out of EHS

2. Regulation

- Examples: Binding targets for e.g. Renewables, Recycling; Land and Water

3. Information and incentives

- Examples: Public innovation fund; food waste; insulation

4. Behavioural changes of consumers / citizens

- ▶ Detailed results will shortly be available at: www.polfree.eu

Thank you for your attention

CONTACT PERSON



Martin Distelkamp

T +49 (0) 541-40933 - 160

E [distelkamp @ gws-os.com](mailto:distelkamp@gws-os.com)

Senior economist

Macroeconometric policy studies, Global Modelling &
Resource Economics