



Netherlands Environmental Assessment Agency

# Energy R&D Portfolio Analysis based on climate change mitigation

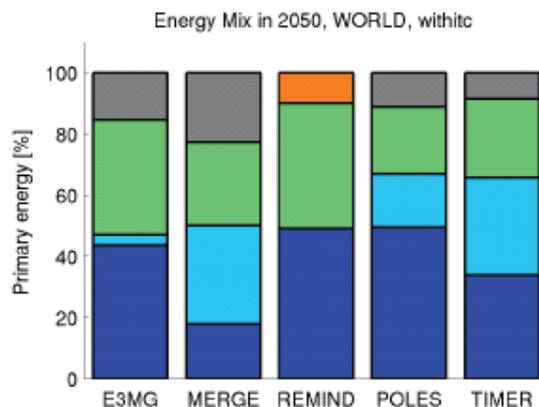
Detlef van Vuuren



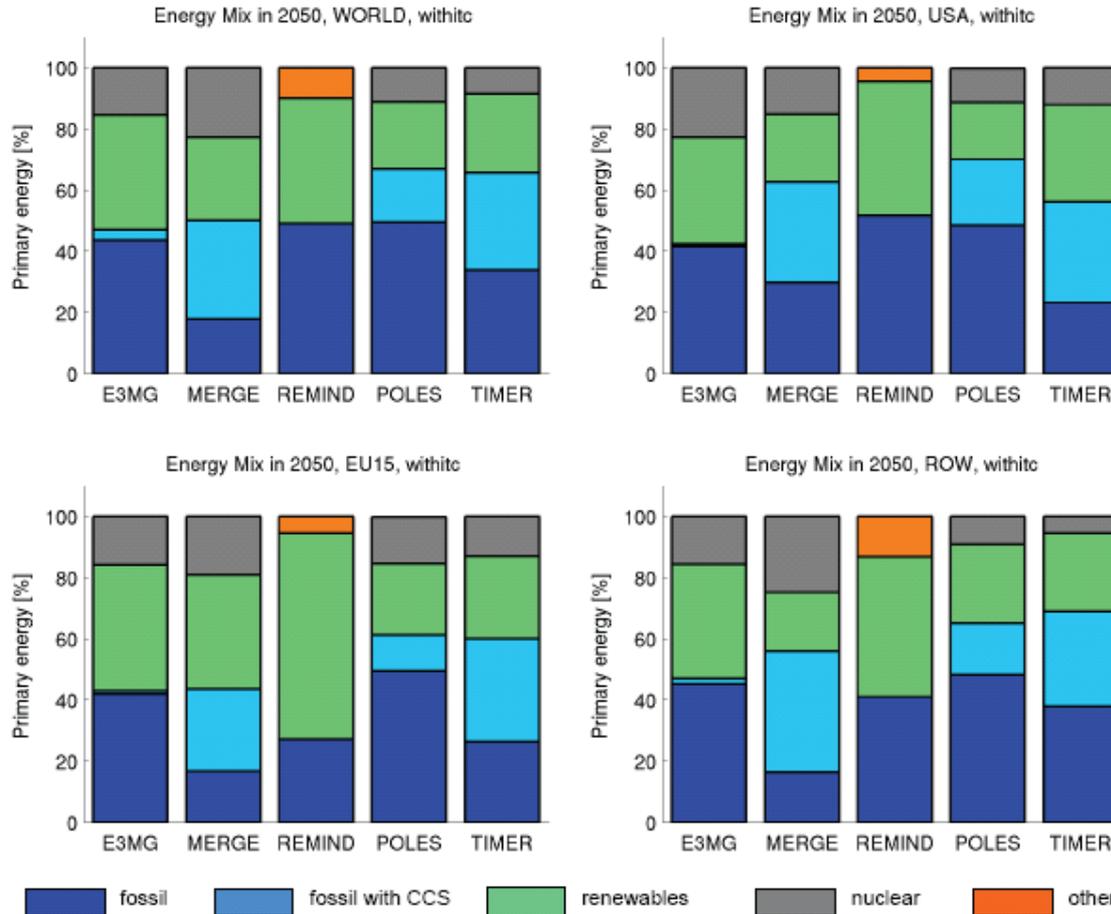
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- Hugh et al. use portfolio analysis based on outcomes of IA model
    - Exogenous specification of technology change – in combination with R&D investment levels
    - IAM modelling to determine the actual performance of the modelling
    - 2 rounds... 2<sup>nd</sup> round more advanced (individual technologies)
    - Useful input in decisions on R&D strategies

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- Results depending on:
    - The model (MiniCAM)
    - Assumptions (which stabilisation level, what kind of context – e.g. centralisation, role of electricity, fossil fuel prices etc.)
    - So how subjective are results?
    - (Results are presented with relatively little explanation)
  - Technology development  $f(\text{R\&D})$  vs.  $f(\text{deployment})$

# Model dependence (stabilisation at 550 ppm CO<sub>2</sub>-eq)



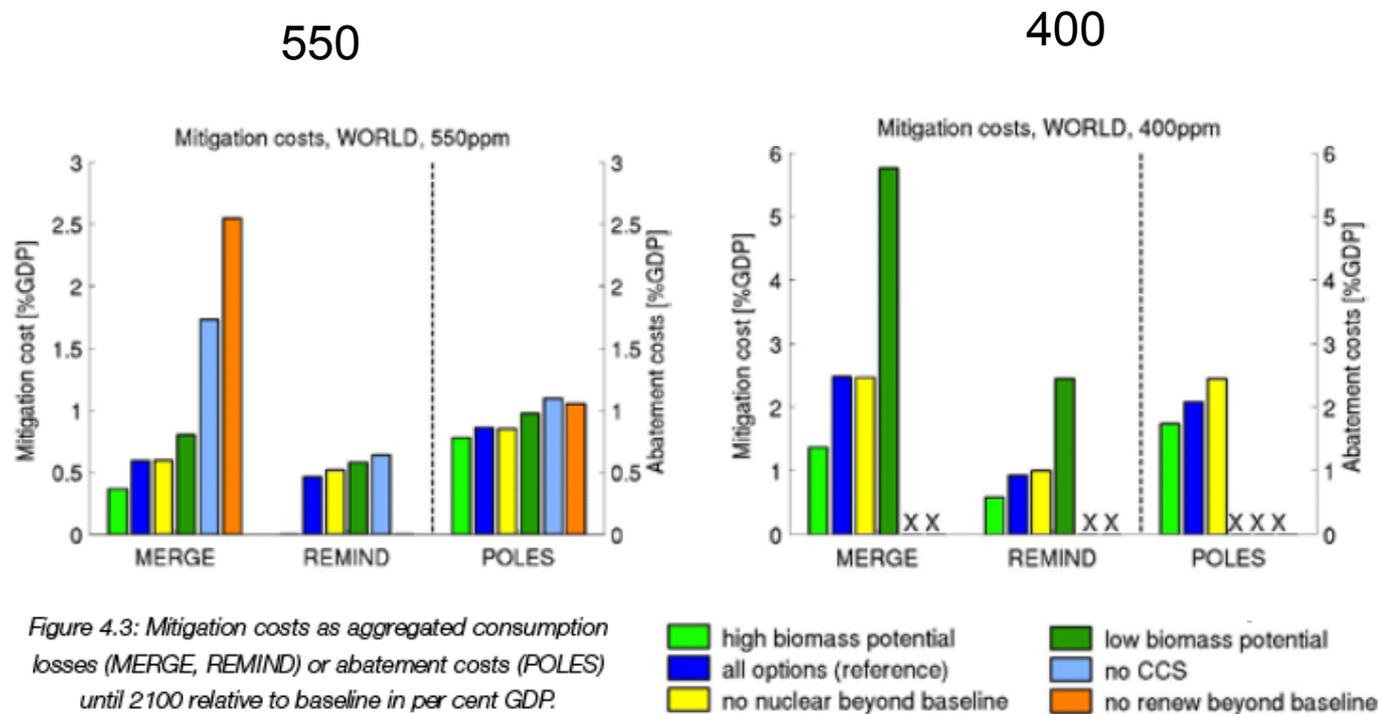
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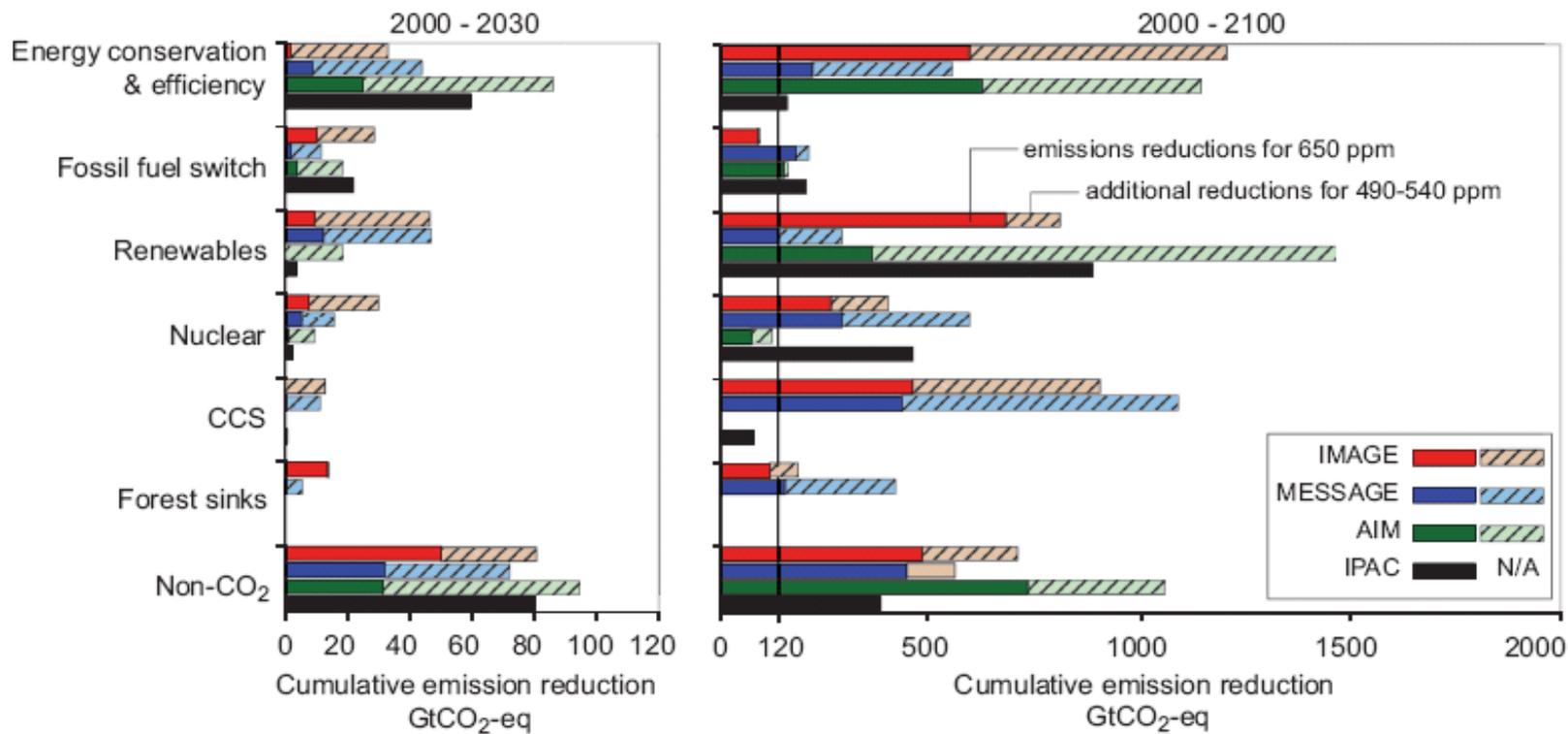


Do model comparison on portfolio analysis?

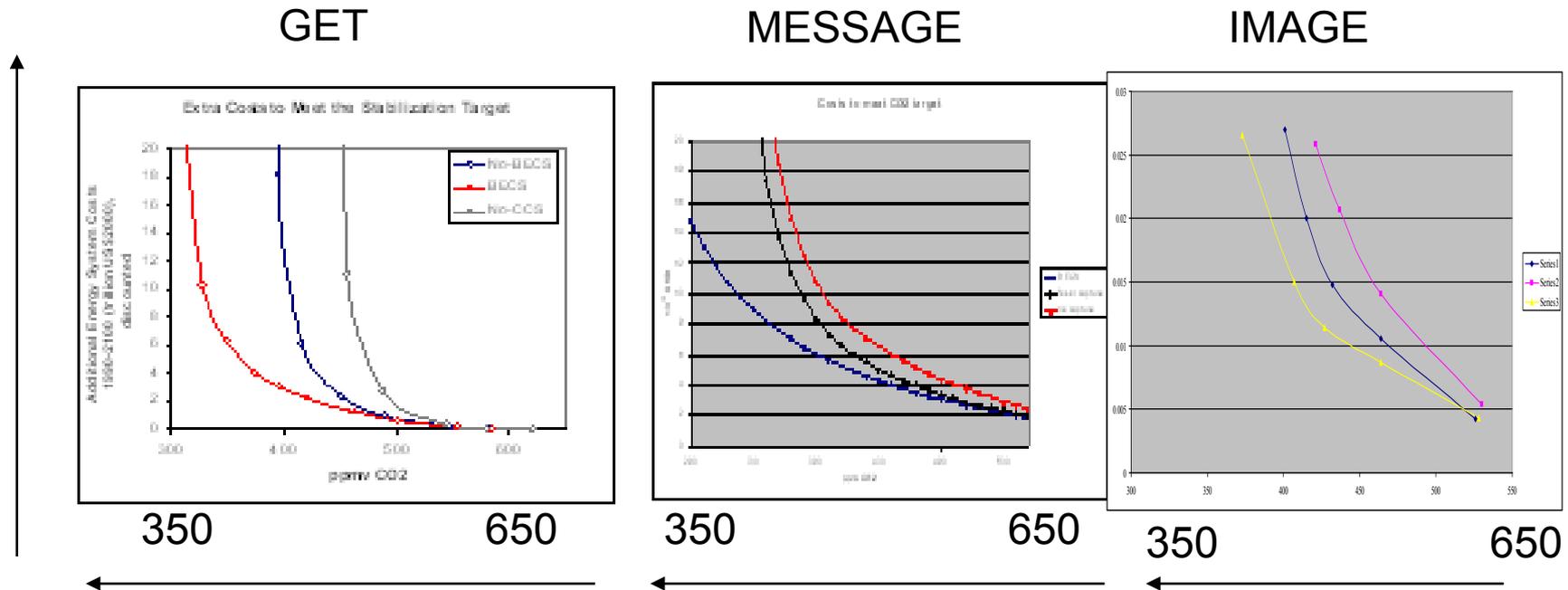
Knopf et al. 2007- ADAM project

# Dependence on stabilisation level





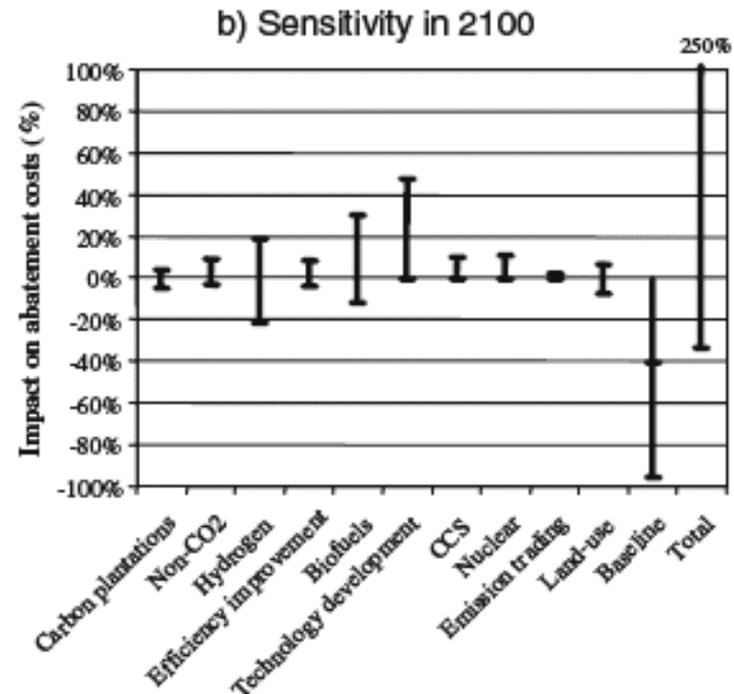
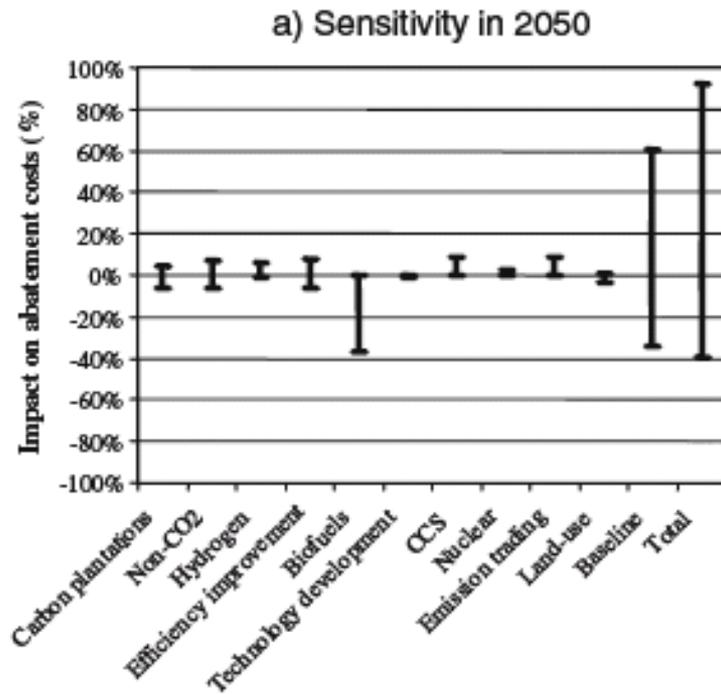
# BECCS only important if below 550



Stabilisation levels

1. No CCS
2. Fossil CCS
3. Bio-CCS

Azar et al. (unpublished). On the Attainability of Low CO2 Concentration Targets



Combination of technologies matter:  
 No CCS small increase  
 No nuclear small increase  
 No CCS/nuclear: Large costs increase

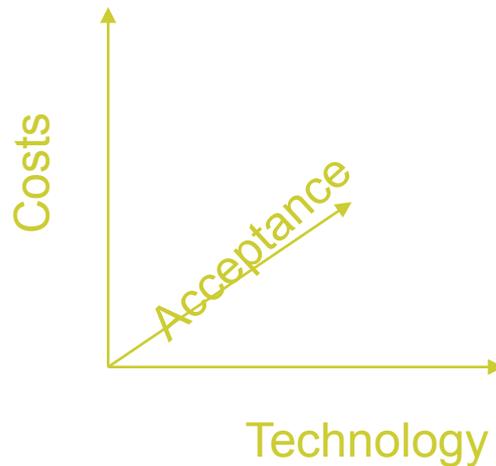
Role of renewables depending on grid assumptions  
 Role of some technologies depending on H2 assumptions  
 Some technologies share subcomponents

## Proposal: distinguish consistently between context and technology parameters

Wind: Advanced wind / non-advanced wind

Nuclear: No nuclear / with nuclear is not pure tech but acceptance

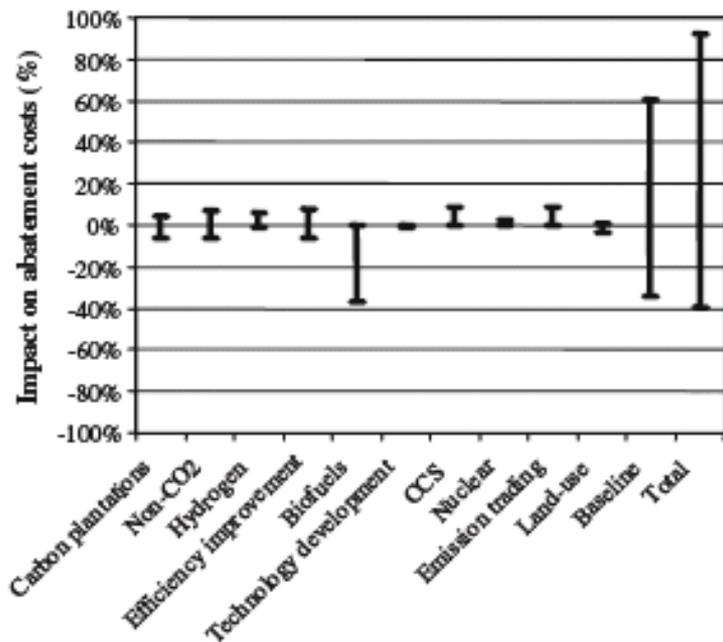
CCS: No CCS / CCS is not pure technology but acceptance.



Wind: Test impact of totally excluding. Might also be low impact



a) Sensitivity in 2050



b) Sensitivity in 2100

