Reconciling BECCS, REDD+ and Food Security

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BECCS AND CLIMATE TARGETS
Global Energy Portfolio – 1.5-2DG target

Source: Azar et al. 2010
Efficiency & Demand-side Focus
(= high flexibility for supply)

- Energy savings (efficiency, conservation, and behavior)
- ~50% renewables by 2050
- Phase-out of oil in the medium term (necessary)
- No expansion of nuclear (choice)
- Fossil CCS (optional bridging technology)
- Bio-CCS & negative emissions (long-term)
Supply-side Focus
(= high demand-side flexibility)

Rapid up-scaling of all supply options including renewables, nuclear and CCS

Modest efficiency focus

CCS & BECS mandatory at high demand
Value of Negative Emission Technologies (NETs)

- CO$_2$ becomes a designer gas
- Technological hedge against uncertain but anticipated climate tipping points
- Hedge against non-cooperation
- No need to bet for radical break through technologies
## The Challenge of NETs

<table>
<thead>
<tr>
<th>BECCs indispensible for climate security</th>
<th>.....but, increases competition for land</th>
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<tbody>
<tr>
<td>REDD is a major climate and biodiversity wedge</td>
<td>..... but, increases competition for land</td>
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<tr>
<td>Agricultural land expansion lead to cheaper food supplies</td>
<td>.....but, competition by REDD+ and Biomass increases competition for land</td>
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BIOENERGY AND AGRICULTURAL MITIGATION
Deforestation (Mha)

2° BECCS, AG-mitigation and 2005 Bioenergy demand

Deforestation due to bioenergy
BIOENERGY, AGRICULTURE MITIGATION AND REDD+
REDD+ Scenario

Marginal RED price $/tCO₂

Before taxes and transaction costs
Deforestation can fully be avoided under 2º BECCS
FOOD SECURITY
CONSEQUENCES
Commodity Price

- Livestock: Baseline (1.2), REDD++ (1.8)
- Crops: Baseline (1.1), REDD++ (1.2)
Concentration of Production
Wheat Traded (%) in 2050

More trade => Less volatility?
Conclusions

- BECCS, REDD+ and Food security are necessary for long-term sustainability.
- BECCS, REDD+ and Food can be synergistic if efficiently planned.
  - Trade, Investment, Technology
- Only a global and integrated land use approach will deliver...
In the 21\textsuperscript{st} century mankind can no longer afford to be inefficient land managers!!! – we are simply too many…