AUSTRALIAN-GERMAN CLIMATE & ENERGY COLLEGE

THE UNIVERSITY OF MELBOURNE

Ambitious climate mitigation, human rights and land use

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Ensuring human rights in climate change mitigation actions

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Paris Agreement purpose and long-term goal

"…holding the increase in the global average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5 °C above pre-industrial levels"

[Paris Agreement, Art. 2]

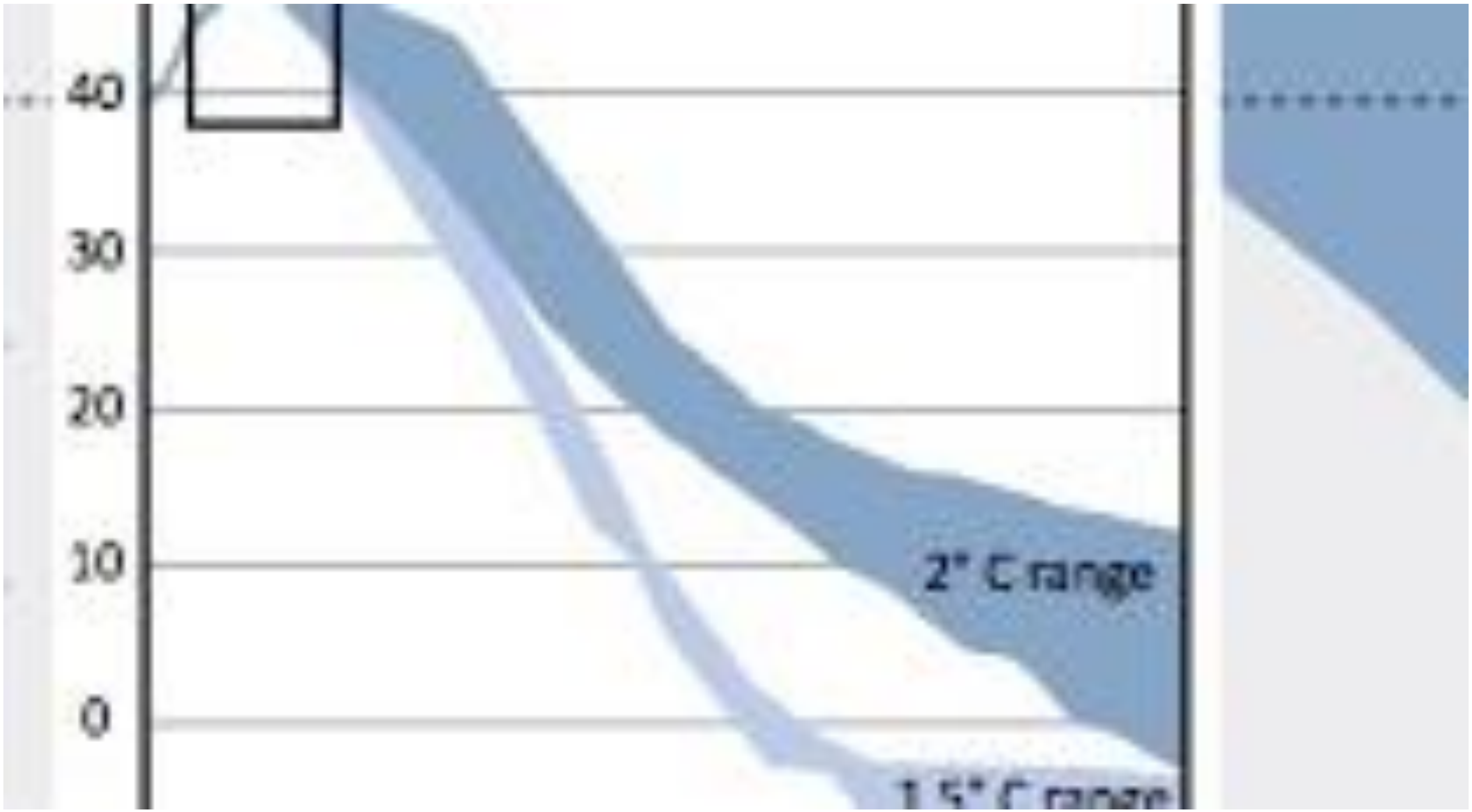
"…reach global peaking of greenhouse gas emissions as soon as possible, recognizing that peaking will take longer for developing country Parties, and … achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century"

[Paris Agreement, Art. 4]

Carbon budget depends on the temperature threshold and risk of exceeding it

Cumulative CO_2 emissions from 1870 in $GtCO_2$									
Net anthropogenic warming [a]	<1.5°C			<2°C			<3°C		
Fraction of simulations meeting goal [b]	66%	50%	33%	66%	50%	33%	66%	50%	33%
Complex models, RCP scenarios only [c]	2250	2250	2550	2900	3000	3300	4200	4500	4850
Simple model, WGIII scenarios [d]	No data	2300 to 2350	2400 to 2950	2550 to 3150	2900 to 3200	2950 to 3800	n.a. [e]	4150 to 5750	5250 to 6000
Cumulative CO_2 emissions from 2011 in $GtCO_2$									
Complex models, RCP scenarios only [c]	400	550	850	1000	1300	1500	2400	2800	3250
Simple model, WGIII scenarios [d]	No data	550 to 600	600 to 1150	750 to 1400	1150 to 1400	1150 to 2050	n.a. [e]	2350 to 4000	3500 to 4250
Total fossil carbon available in 2011 [f]: 3670 to 7100 $GtCO_2$ (reserves) and 31300 to 50050 $GtCO_2$ (resources)									

Mitigation pathways depend on peaking year and rate of reductions



Source: UNEP Gap Report 2015

Three risks of negative emission measures

Risk 1: Infeasibility

Negative emission options do not prove feasible in the future when they are ultimately required.

Risk 2: Unnacceptable impacts

Negative emission options are feasible, but cannot be implemented at the required scale because of unacceptable ecological and social impacts.

Risk 3: Reversal

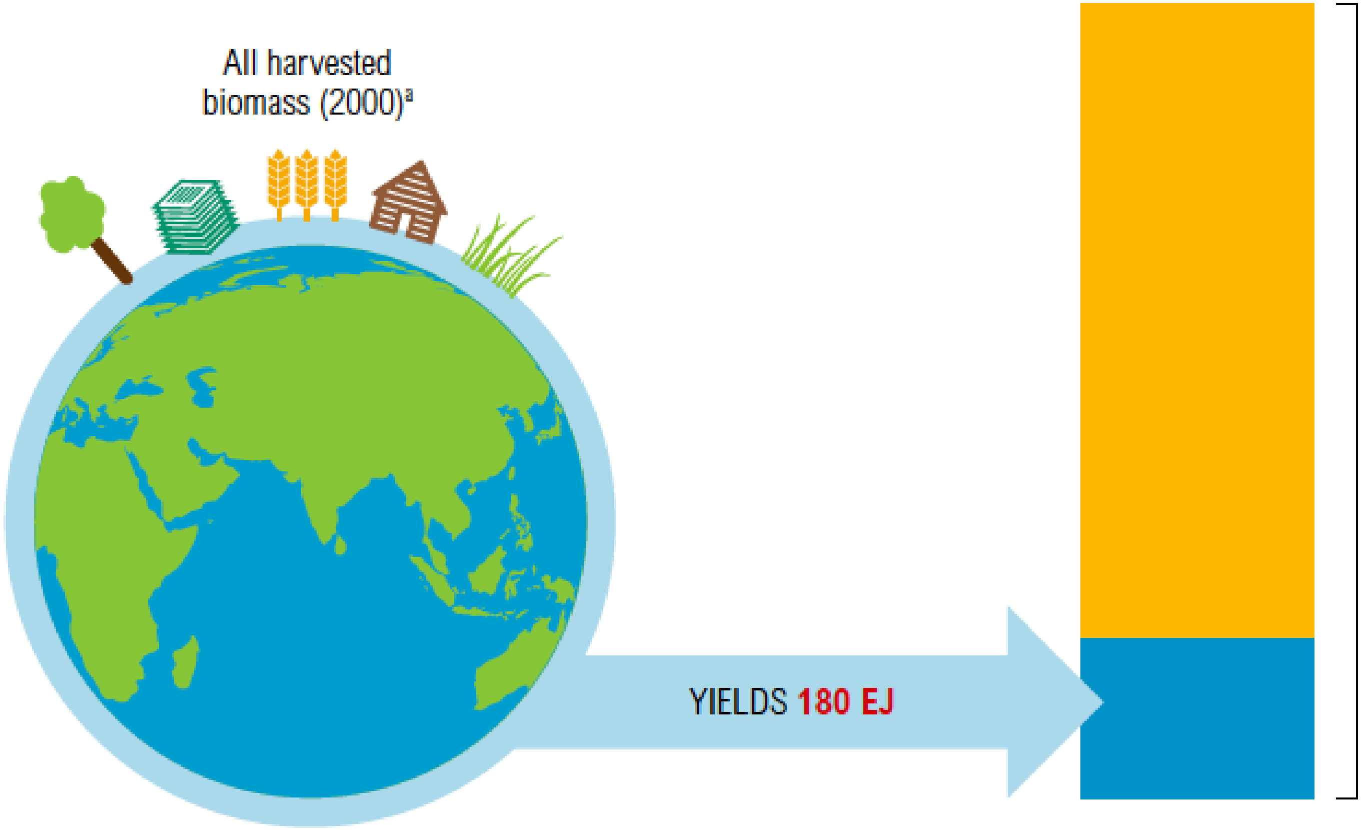
Negative emission options are implemented at the required scale, but human or natural forces, including climate change, compromise land-based sinks and reverse emission reductions.

Scale of land use for ‘negative emissions’

Bioenergy with Carbon Capture and Storage (BECCS)

- Biophysical constraints - limits biomass supply
- Resource constraints – available land, water and nutrients

Figure 4 | **Using All of the World's Harvested Biomass for Energy Would Provide Just 20 Percent of the World's Energy Needs in 2050** (Exajoules per year)



Source: Authors' calculations based on Haberl et al. (2007), IEA (2008), and JRC (2011).
Note: a. Total amount of crops, harvested residues, grass eaten by livestock, and harvested wood contained 225 EJ, but would replace only 180 EJ of fossil fuels because of conversion efficiencies from biomass to useable energy.

Source: Searchinger 2015

Scale of land use ‘negative emissions’

Bioenergy with Carbon Capture and Storage (BECCS)

- Biophysical constraints
- Resource constraints – available land, water and nutrients
- Food security – zero dedicated use of land for bioenergy
  - Waste and residues: limited in supply

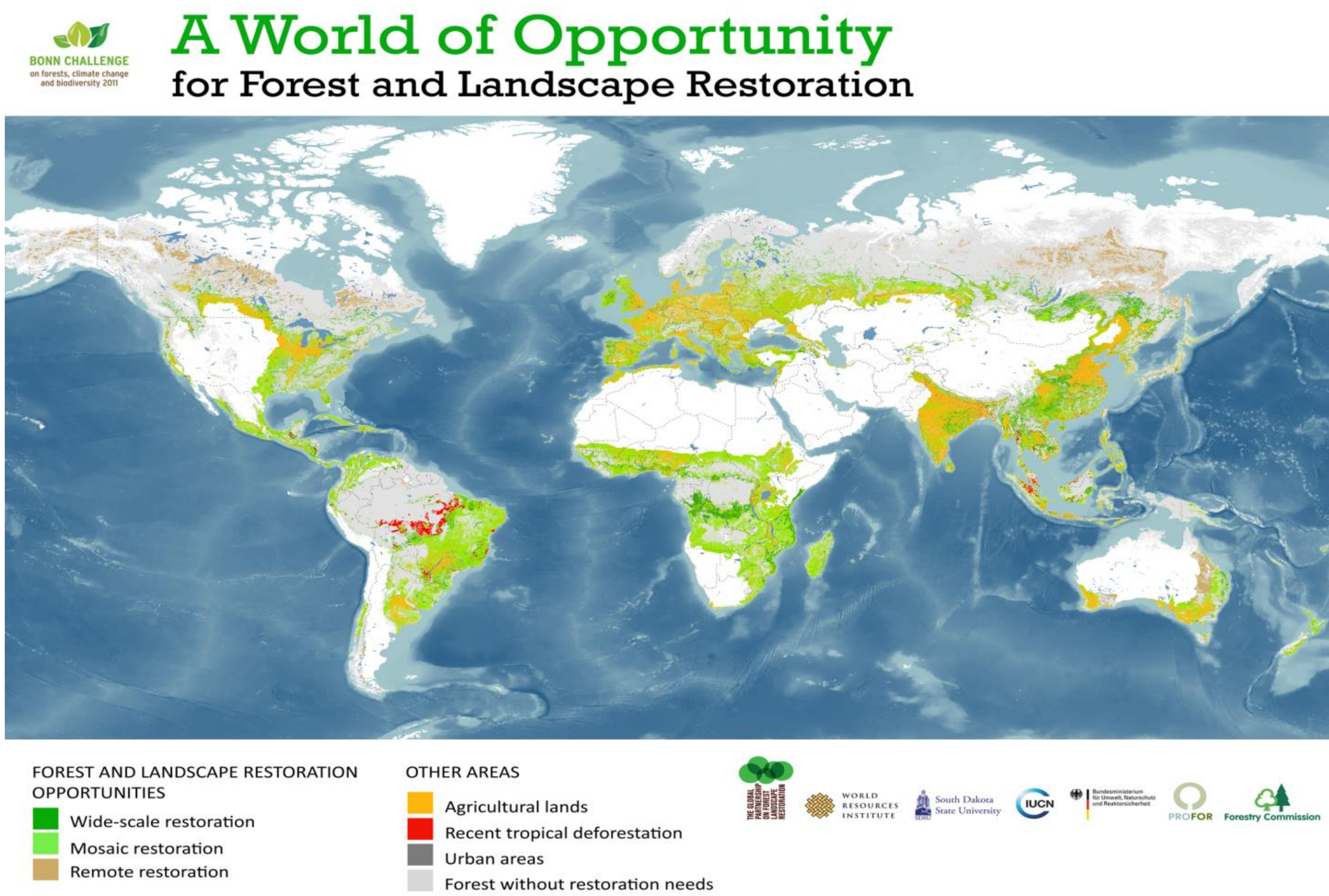
Forest plantations

- Large areas of land – 500 mha and up to 2 billion ha
- Negative impacts on biodiversity, ecosystems, customary land rights and livelihoods.
- Resource intensive – water and nitrogen inputs

Forest and ecosystem restoration

- Consistent with global sustainable development agenda

Lack of clear customary and collective rights to land a major driver of forest loss and enables land grabs



Conclusions

- Halting tropical forest loss and restoring degraded forests key to achieving the 1.5 goal
- Lessons from REDD+ and other global forest initiatives: respecting and strengthening collective rights to land best way to protect forests
- Serious risks of social and environmental impacts from mitigation activities
  - Avoid perverse incentives in policy design
  - In implementation strengthen respect for international standards and obligations
- This requires further understanding of just, equitable and science-based mitigation pathways