



Energy, Industrial Systems and Transformations in Land and Biomass Use

Climate change: resilience, transformation, and equity **Outreach event on the IPCC Sixth Assessment Report:** key findings and their relevance to Asia

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Deep emissions reductions imply significant transformations in energy, industry & land/biomass use





However, these transformations will differ significantly between the global North and global South

a) Historical cumulative net anthropogenic CO₂ emissions per region (1850–2019)



1850

b) Net anthropogenic GHG emissions per capita and for total population, per region (2019)

 CO_2 GHG North America 20 Australia, Japan and New Zealand / GHG emissions (tCO₂-eq per capita) Eastern Europe and West-Central Asia Middle East 15 Eastern Asia Latin America and Caribbean Europe 10 South-East Asia and Pacific Africa Southern Asia 2000 4000 6000 8000 Population (millions) Net CO₂ from land use, land use change, forestry (CO₂LULUCF) Other GHG emissions Fossil fuel and industry (CO₂FFI)

All GHG emissions

2019

1990

Significant cost reductions have led to rapid market adoption for solar, wind and electric vehicles

a) Market Cost

Since AR5, the unit costs of some forms of renewable energy and of batteries for passenger EVs have fallen.

below this point, costs can be less than fossil fuels —

Fossil fuel cost (2020)

b) Market Adoption

Since AR5, the installed capacity of renewable energies has increased multiple times.



A disproportionate share of land is used for livestock and animal feed





by sub-national unit (scenario B2)

Source: Bailis, 2015

Significant emissions reductions are cost-effective and feasible in energy and industry; Land sectors are more varied/complex but there are often potential synergies between mitigation and adaptation

Insufficient evidence

0-20 (USD per tCO₂-eq) 20–50 (USD per tCO₂-eq)

100-200 (USD per tCO₂-eq) Cost not allocated due to high variability or lack of data

- ASEAN region has significant dependence on agriculture, forestry and fishing
- •Foreign direct investment in these sectors in ASEAN is among the most significant in the world
- •The region is home to some of the world's richest biodiversity
- •The region has faced significant levels of deforestation, agricultural burning, air pollution and related sources of emissions and development dis-benefits
- Investment and interest in bioeconomy and biotechnology is increasing in the region
- •For all of these reasons, the land sectors in ASEAN are strategically crucial as carbon sinks and reservoirs of biodiversity

Some closing observations

- 4. Learning and investment are needed to move to best practice and reduce land impacts on land and ecosystems.
- food security, bio-based industries.
- 6. Unlike non-land measures and technologies (industry, energy, transport) there is higher potential for active (i.e. not passive) participation in the transition, and better stewards of land and ecosystems.

1. Deep emissions reductions required for 1.5/2C imply transformations across all sectors 2. These transformations are especially significant for land sectors and the global South 3. Progress has been in made in energy and industry in cost reductions and learning curves; remaining barriers often non-economic but related to financing or institutions pressures; delays risk overshooting 1.5/2C and deepening poverty/inequality due to

5. Land is where people live! There are significant opportunities for ecological and socio-economic co-benefits, especially in rural areas: ecosystem health, biodiversity,

therefore a stronger contribution to democracy and human rights, as people become

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Thanks for your attention! Note: Figures in the presentation are from IPCC AR6 unless otherwise noted

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