What does it imply for Uganda's Development?

Scope for low carbon development

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INTERGOVERNMENTAL PANEL ON climate change

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Adaptation-Mitigation

Africa stands to benefit from integrated climate adaptation, mitigation and development approaches

Industry

Almost 80% of LDCs consider the industrial sector as a key element in their development strategies.

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Globally, Almost 80% of the GHG emission growth between 2000 and 2010 comes from the energy supply and industry sectors.

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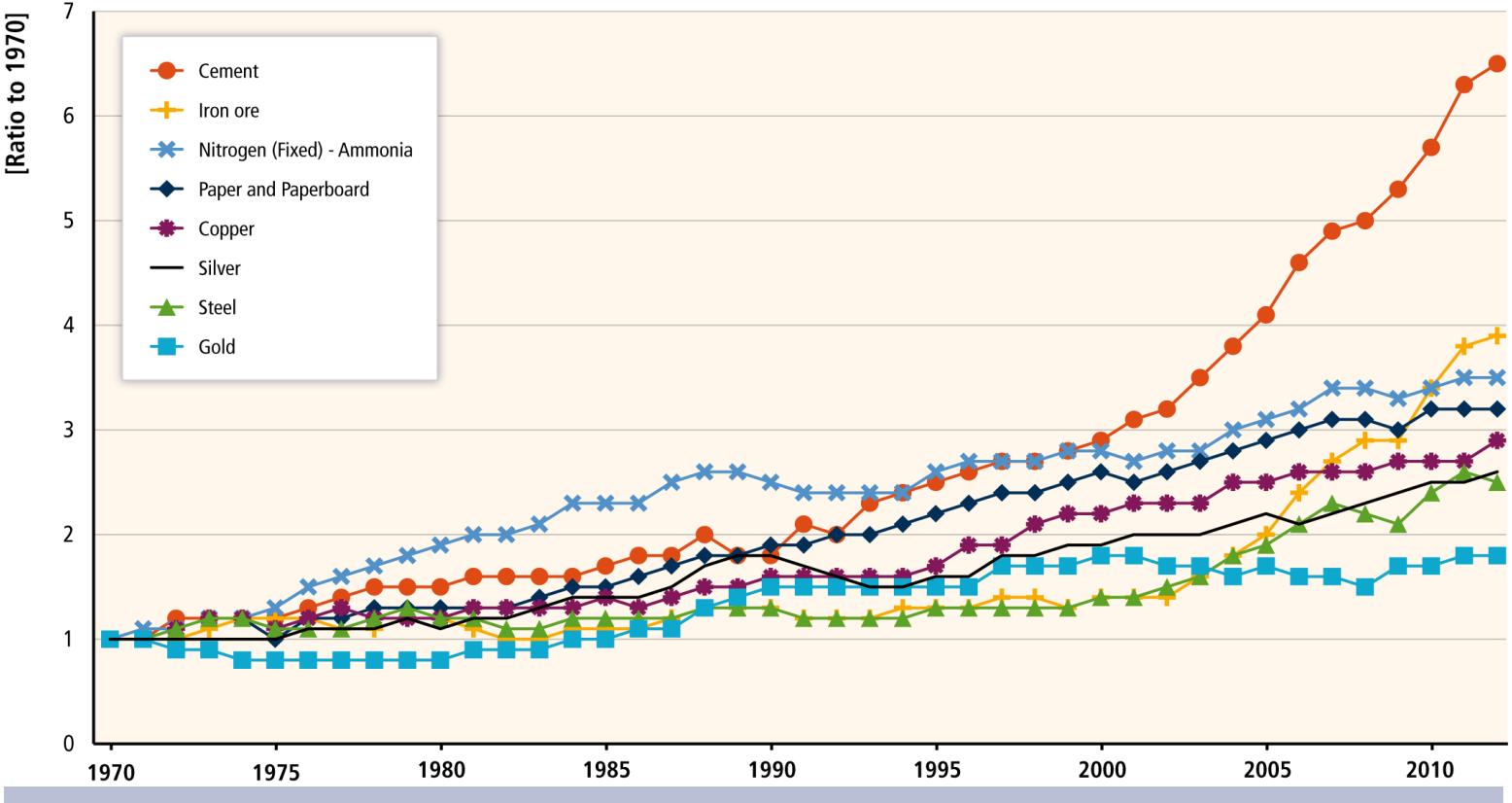
World production of minerals and manufactured products is growing steadily driving GHG emissions



Industry

LDCs have to be treated separately because of their small manufacturing production base. The share of manufacturing value added (MVA) in the GDP in 2011 was 7.2% Africa LDCs; while it was 21.8% in developing countries and 16.5% in developed countries.

Industry

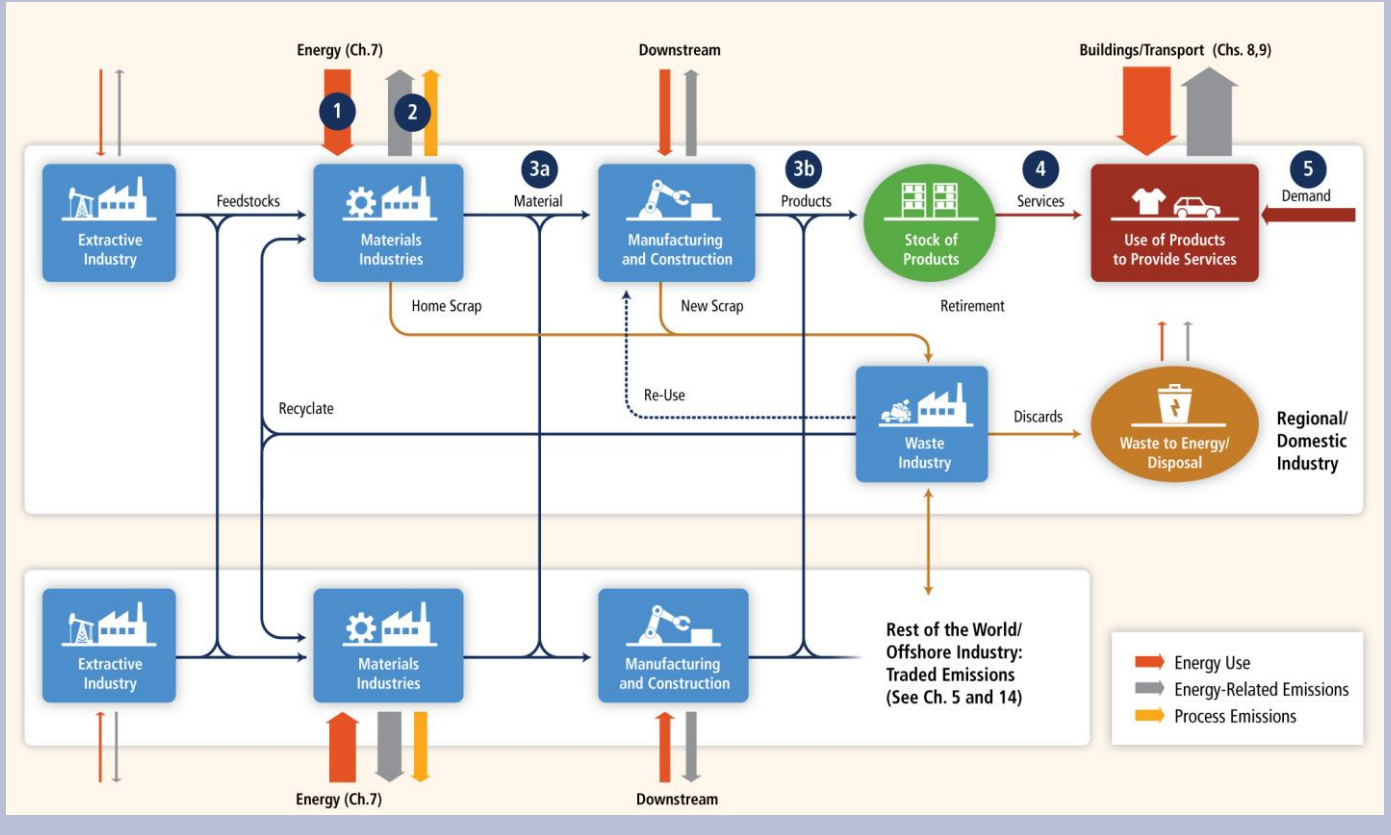
In most LDCs, the share of extractive industries has increased (in many cases with important economic, social, and environmental problems while that of manufacturing either decreased in importance or stagnated.

Industry

In extractive industries in most of the countries in Africa, Latin America, and the transition economies produce more than they use; whereas use is being driven mainly by consumption in China, India, and developed countries.

“African countries have abundant opportunities to adopt clean, efficient low-carbon technologies and practices. They can side step the inefficient, fossil fuel-dependent infrastructure that more developed countries are ‘locked into’”

Five main options for reducing GHG emissions in the industry sector (considering also traded goods)



Industry I

- **GHG mitigation option categories comprises**

  (1) Energy efficiency (e.g., through furnace insulation, process coupling, or increased material recycling);

  (2) Emissions efficiency (e.g., from switching to non-fossil fuel electricity supply, or applying CCS to cement kilns);

  (3) Material efficiency

  (3a) Material efficiency in manufacturing (e.g., through reducing yield losses in blanking and stamping sheet metal or re-using old structural steel without melting);

  (3b) Material efficiency in product design (e.g., through extended product life, light-weight design, or de-materialization);

  (4) Product-Service efficiency (e.g., through car sharing, or higher building occupancy);

  (5) Service demand reduction (e.g., switching from private to public transport, new product design with longer life)

Industry

LDCs identify technologies in the Industrial sector : fuel switching (42%), energy efficiency (35%), mining (30%), high efficiency motors (25%), and cement production (25%).

Industry II

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From a short and mid-term perspective energy efficiency and behaviour change could significantly contribute to GHG mitigation

- The energy intensity of the industry sector could be directly reduced by up to approximately 25% compared to the current level through the wide-scale deployment of best available technologies, upgrading/replacement, particularly in countries where these are not in practice and in non-energy intensive industries
- Additional energy intensity reductions of up to approximately 20% may potentially be realized through innovation

Industry III

In the long-term a shift to low-carbon electricity, radical product innovations (e.g. alternatives to cement), or CCS (for mitigating i.a. process emissions) could contribute to significant (absolute) GHG emissions reductions

Systemic approaches and collaborative activities across companies and sectors and especially SMEs through clusters can reduce energy and material consumption and thus GHG emissions

Important options for mitigation in waste management is waste reduction, followed by re-use, recycling and energy recovery

Significant mitigation potentials exist in various cost ranges including cost effectives measures (case study of steel)

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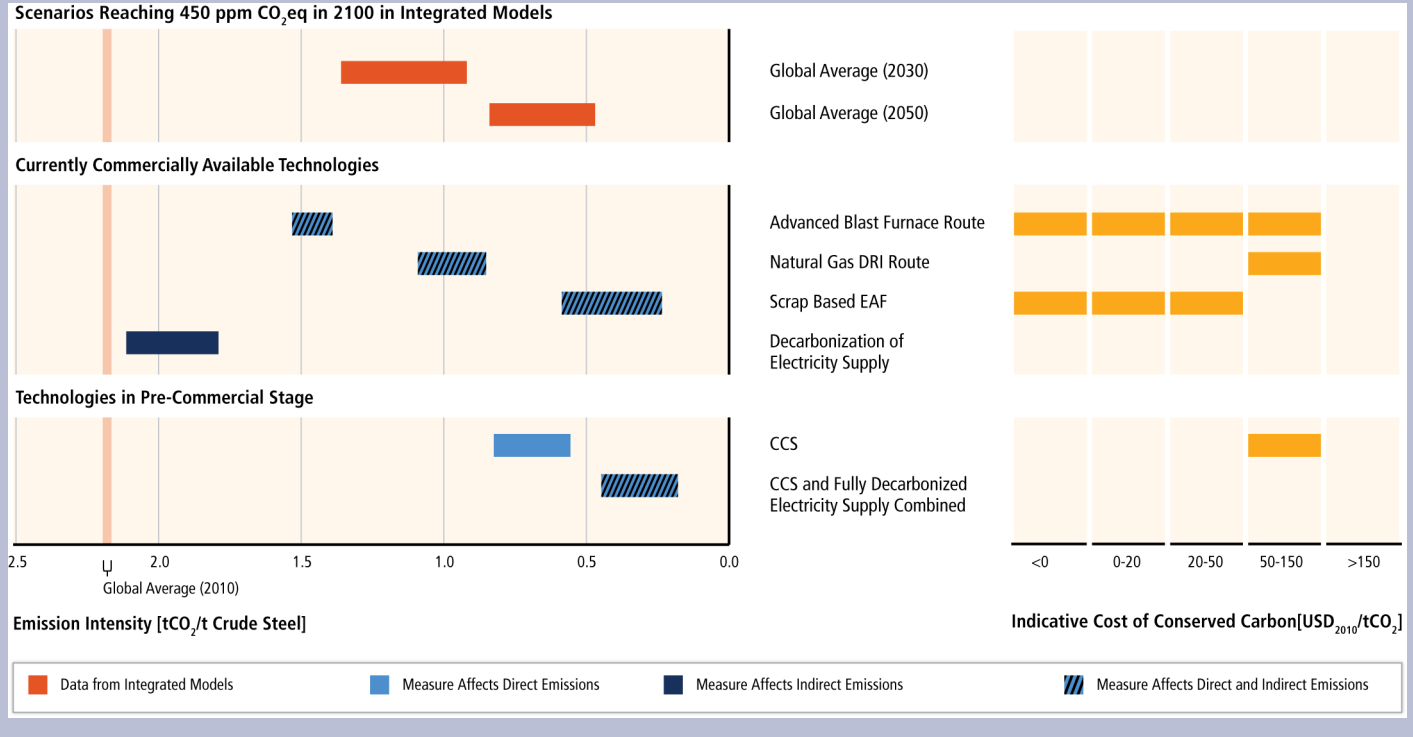

Emissions from the *waste sector* have doubled since 1970 – mitigation measures can follow waste hierarchy

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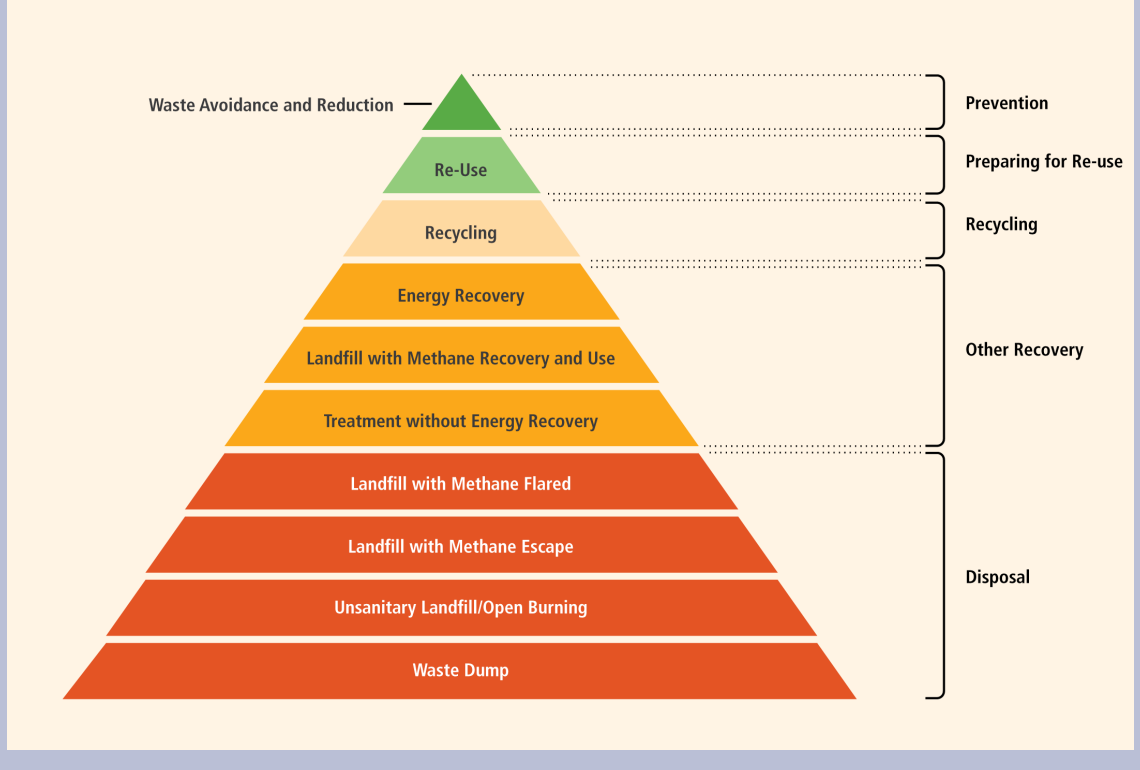


Waste

Approximately 47% of wastewater produced in the domestic and manufacturing sectors is untreated, particularly in South and Southeast Asia, Africa as well as Central and South America.

Wastewater treatment plants are highly capital-intensive.

Therefore, innovations related to decentralized wastewater infrastructure are becoming promising.

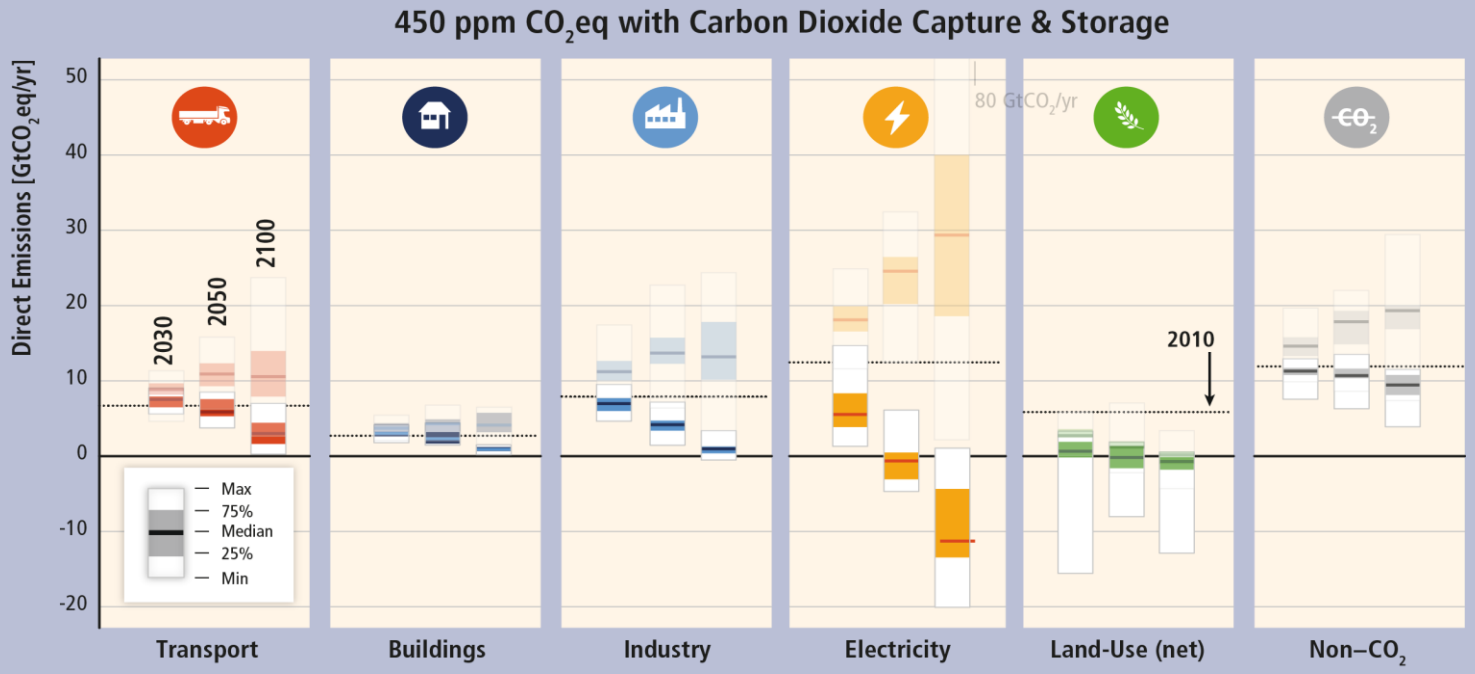
Waste

In the case of landfills, the top five emitting countries account for 27% of the total abatement potential in the sector (United States 2%, China 6%, Mexico 9%, Malaysia 3%, and Russia 2%). The distribution of the remaining potential per region is: Africa 16%, Central and South America 9%, Middle East 9%, Europe 19%, Eurasia 2%, Asia 15%, and North America 4% (EPA, 2013).

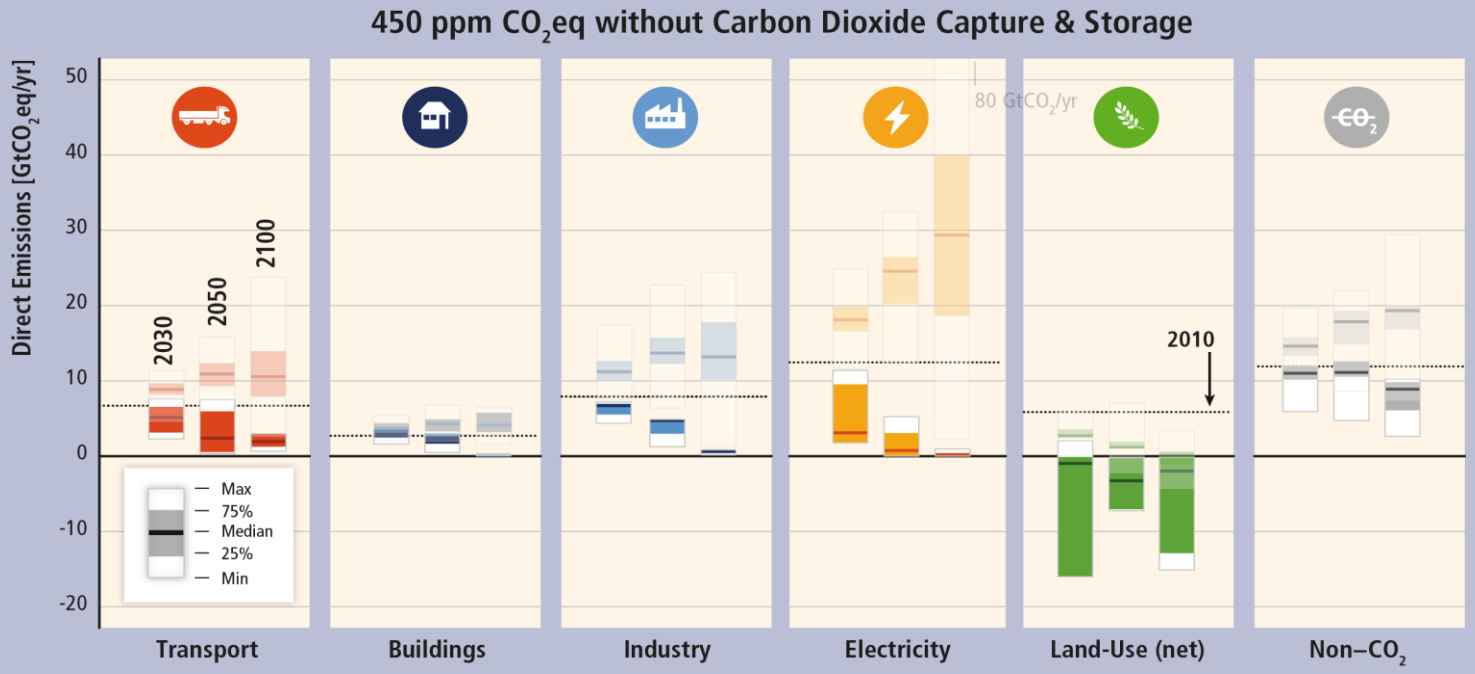
Waste

In the case of wastewater, 58% of the abatement potential is concentrated in the top five emitting countries (United States 7%, Indonesia 9%, Mexico 10%, Nigeria 10%, and China 23%). The distribution of the remaining potential per region is: Africa 5%, Central and South America 5%, Middle East 14%, Europe 5%, Eurasia 4%, and Asia 10% (EPA, 2013).

Systemic approaches to mitigation across the economy are expected to be most environmentally as well as cost effective.



Efforts in one sector determine mitigation efforts in others. Importance of negative emission option in ambitious mitigation scenarios.



Co-benefits

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Mitigation measures	Effect on additional objectives/concerns		
	Economic	Social (including health)	Environmental
Technical energy efficiency improvements via new processes and technologies	↑ Energy security (via reduced energy intensity) [1, 2, 3, 4, 13, 29, 57]; ↑ Employment impact [14, 15, 19, 28] ↑ Competitiveness and Productivity [4, 5, 6, 7, 8, 9, 10, 11, 12] ↑ Technological spillovers in DCs (due to supply chain linkages) [59, 60, 61]	↓ Health impact via reduced local pollution [16] ↑ New business opportunities [4, 17–20] ↑ Water availability and quality [26] ↑ Safety, working conditions and job satisfaction [5, 19, 20]	Ecosystem impact via ↓ Fossil fuel extraction [21] ↓ Local pollution [11, 22–24, 25] and ↓ Waste [11, 27]
CO_2 and non-CO_2 emissions intensity reduction	↑ Competitiveness [31, 55] and productivity [52, 53]	↓ Health impact via reduced local air pollution [30, 31, 32, 33, 53] and better work conditions (PFC from aluminium) [58]	Ecosystem impact via ↓ Local air pollution [4, 25, 30, 31, 34, 52] ↓ Water pollution [54] ↑ Water conservation [56]
Material efficiency of goods, recycling	↓ National sales tax revenue in medium term [35] ↑ Employment impact in waste recycling market [44, 45] ↑ New infrastructure for industrial clusters [36, 37] ↓ Competitiveness in manufacturing [38]	↑ New business opportunities [11, 39–43] ↓ Local conflicts (reduced resource extraction) [58] ↓ Health impacts and safety concerns [49]	↓ Ecosystem impact via reduced local air and water pollution, waste material disposal [42, 46] ↓ Use of raw/virgin materials and natural resources implying reduced unsustainable resource mining [47, 48]
Product demand reductions	↓ National sales tax revenue in medium term [35]	↓ Local conflicts through inequity in consumption ↑ New diverse lifestyle concept [48, 50, 51]	↓ Post consumption waste [48]

Multiple objectives

Decentralised, renewable systems can prove more resilient to climate extremes such as storms, droughts and very high temperatures, which may affect the performance of conventional sources of power such as large hydropower dams or large power stations reliant on water for cooling. The damage to energy supplies every year caused by cyclones in Mozambique is a case in point.

Multiple objectives: AFOLU

Another African example of multiple benefits from sustainable development pathways is community-based carbon offset and agroforestry schemes. These programmes
provide development benefits, help communities adapt and mitigate climate change.

Multiple objectives: AFOLU

Agroforestry schemes

allow farmers to generate income and accumulate assets from carbon capture, wood-based energy and improving soil fertility, as well as potentially promoting sustainable wood production. Integrated agroforestry schemes across Africa can have direct benefits for local adaptation, as they enhance agro-ecosystem diversity and resilience, as well as contributing to the global goal of limiting greenhouse gas concentrations in the atmosphere.

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Credibility of such knowledge?

- IPCC AR5 was prepared over seven years by over 800 authors from 85 countries.
- 136,706 review comments from governments, experts and international agencies
- Account of the current state of scientific knowledge relevant to climate change
- Assesses the most recent scientific, technical and socio-economic information produced worldwide relevant to the understanding of climate change.

Finally

- Effort-sharing is fundamental to international cooperation in a global commons problem.
- Effort-sharing seen to be equitable, based on ethical principles may lead to more effective cooperation.
- Mitigation measures interact broadly (and sometimes strongly) with other sustainable development objectives, creating co-benefits or adverse side-effects.

GHG emissions rise with growth in GDP and population; long-standing trend of decarbonisation of energy reversed.

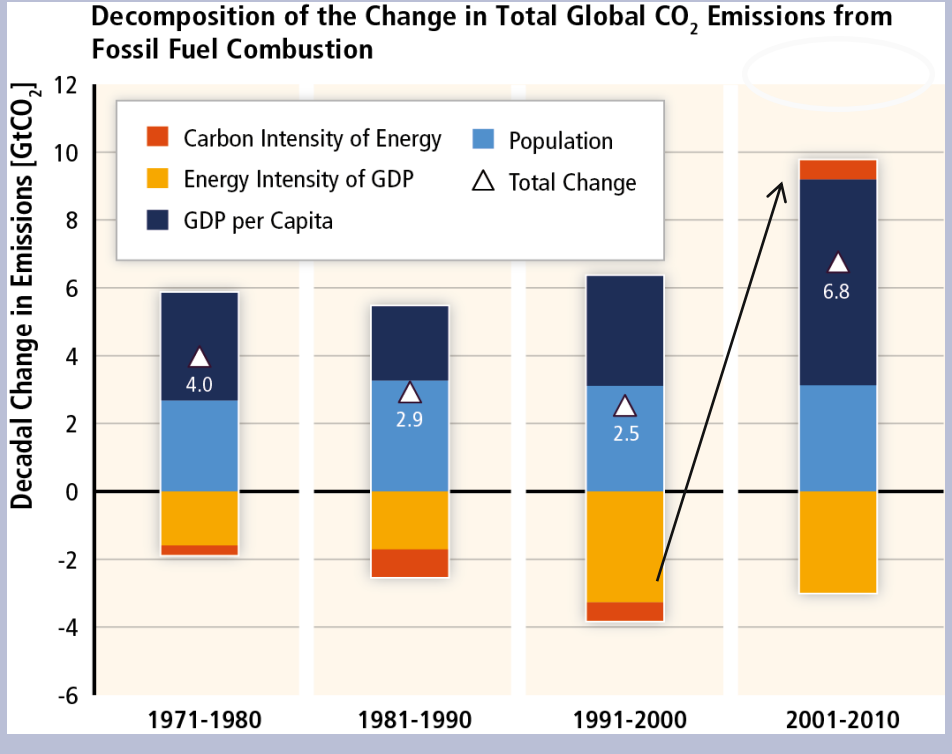

Figure SPM.3

“Multiple benefits: decentralised, renewable energy technologies, improved cook stoves, can markedly alleviate the workload and enhance the personal security of women and girls.”

Advances in technologies, lifestyle change can reduce building sector emission by mid century

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- Low energy building codes to avoid lock in
- Retrofit with 50-90% reduction potential for existing building stocks.
- Lifestyle change, traditional architecture, practices can reduce 20-50% from short to mid century

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Performance of climate finance

- Total public and private climate finance investments are estimated at 343-385 billion USD p.a., almost evenly going to developed and developing countries
- 95% of these investments go to mitigation
- Public climate finance is estimated at 35-49 billion USD p.a.

Thank You

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