

# **The Climate and Development Challenge for Latin America and the Caribbean**

**Options for climate resilient  
low carbon development**

**September 10, 2012**



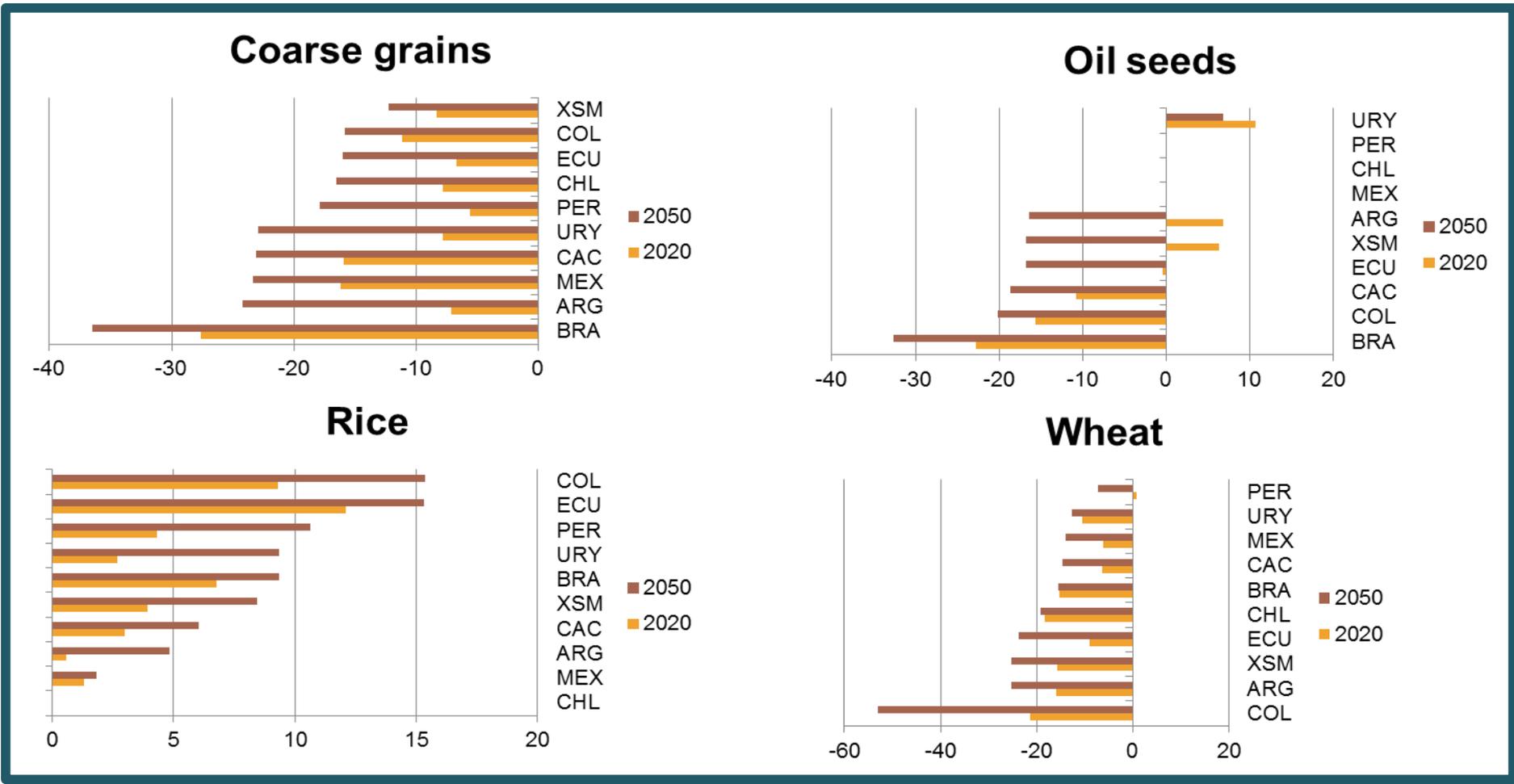
# Objective

- a) what are the key impacts and costs consequence of climate change that most affect the region?, what would be the costs of adaptation?;
- b) how and at what cost would the region be able to reduce its contribution to the global carbon footprint at a level consistent with global climate stabilization goals;
- c) What is the best next step for our institution to address the challenge?

# Main Messages

1. A 2°C rise (probably higher) in temperature above pre-industrial levels is unavoidable this century
  - This temperature rise is now considered to be structurally built into our future
  - And, if no forceful action is taken emissions temperature will further increase and consequences would be much more severe than currently envisaged.
  - In fact a 4°C increase is likely under BAU

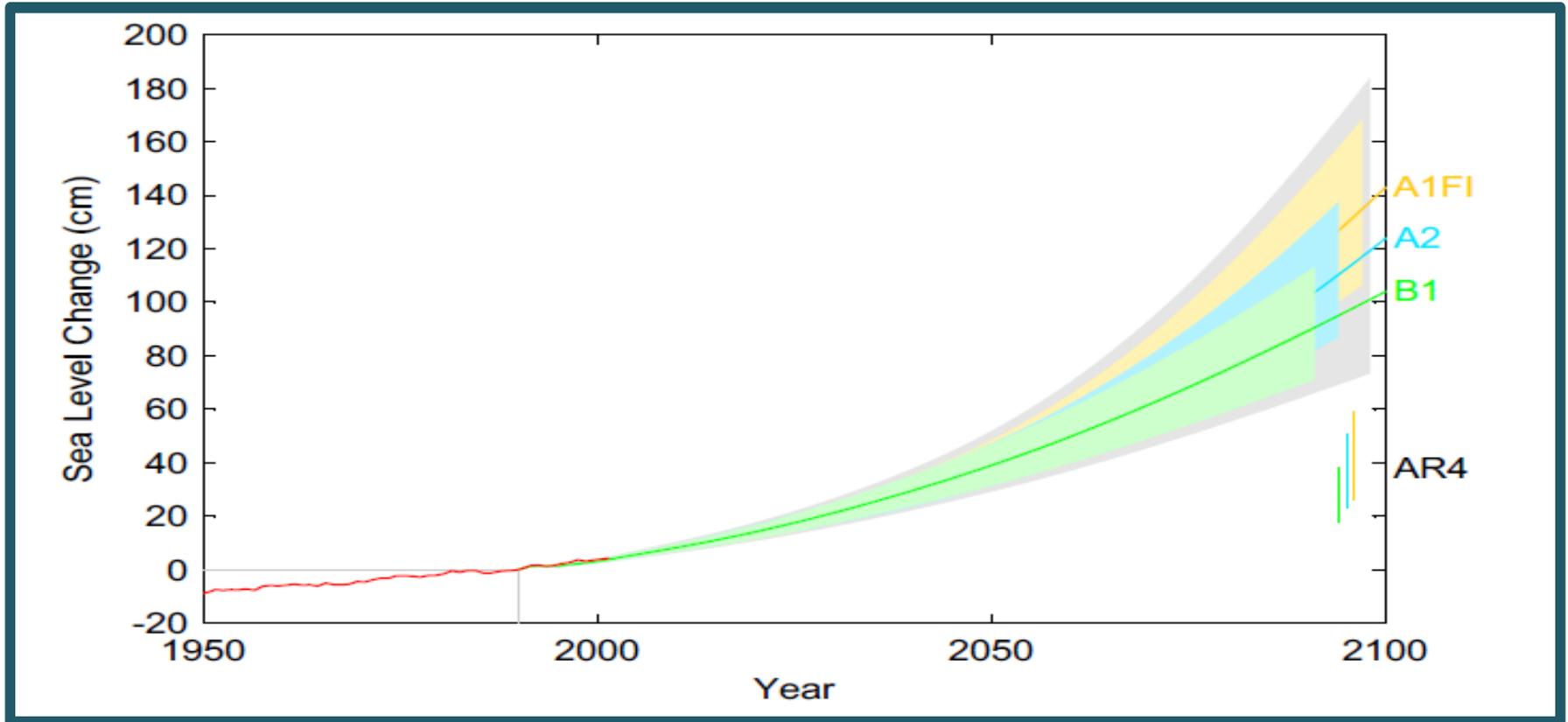
**Forecast of climate change impacts on key crop yields under the A1B scenario.  
Projected losses (in %) by 2020 and 2050.**



Source: Fernandes et. al, 2012



## Projection of sea-level rise from 1990 to 2100, based on IPCC temperature projections for three different emission scenarios



**Source:** Vermeer, M. and S. Rahmstorf (2009).

**Notes:** Three different emission scenarios labeled on right are shown. The sea-level range projected in the IPCC AR4 (2) for these scenarios is shown for comparison in the bars on the bottom right. Also shown is the observations-based annual global sea-level data (Church and White, 2006) (red) including artificial reservoir correction (Chao, *et al.*, 2008).



## 2. The associated physical damages by 2050 are expected to be substantial

- Lower agriculture yields
- Sea level rise
- Collapse of coral biome
- Net increase in frequency and intensity of extreme weather events
- Additional exposure to tropical vector diseases
- Retreat of mountain glaciers
- Unstable hydrology
- Potential rainforest dieback
- Destabilization of ecosystem integrity and species extinction

# Estimate of Annual Monetary Costs Associated to Selected Sample of Physical Impacts

Impact	Area	Billion 2005 US\$
Loss in net export agricultural revenues: wheat, soybean, maize and rice	LAC	26-44
Sea level rise (1m)	LAC	22
Coral bleaching	Caribbean	8-11
Intensification and increase of frequency of extreme weather events	CARICOM Nations	5
Health (increase in incident cases of diarrhea and malnutrition)	LAC	1
Amazon dieback	Latin America	4-8
Glacier retreat	Peru	1
Hydropower generation	Brazil	18
Estimated total *		85-110
% LAC GDP		1.8-2.4

\* Total reported must be considered as a range and a conservative estimate with caveats as: (i) estimations are gathered from different studies with variations in methodologies, assumptions and uncertainties, (ii) many costs are only partially presented and others are difficult to estimate, and (iii) non-monetary costs are not considered. See report for list of references



# Economic damages

3. The economic implications caused by the physical impacts will be significant. Projected economic damages are estimated to gradually increase and reach at least US\$100 billion annually by 2050—or approximately 2.2% of 2010 GDP.

Conservative estimate (does not include damages to biodiversity, to stock of natural resources and other non monetary values)

Damages will undermine the region's future:

- limiting development options
- restricting access to natural resources and ecosystem services
- straining already scarce investment resources

# Adaptation Costs

4. Rapid and decisive adaptation action could reduce many of the economic damages, at only a fraction of these costs; but, adaptation will not be able to arrest much of the losses caused in natural capital

Overall costs required to adapt to the unavoidable physical impacts – irrespective of even drastic reductions in emissions – are estimated to be on the order of 20% to 25% of the cost of damages

# Stabilization Goal

## 5. Global mitigation actions are essential to stabilize GHG concentrations and prevent further damages

To stabilize climate no more than 2 tpc and no more than 20 Gt would need to be released by 2050

And no more than 10 GT should be emitted by the end of the century

Failure to stabilize would result in much higher costs and physical impacts

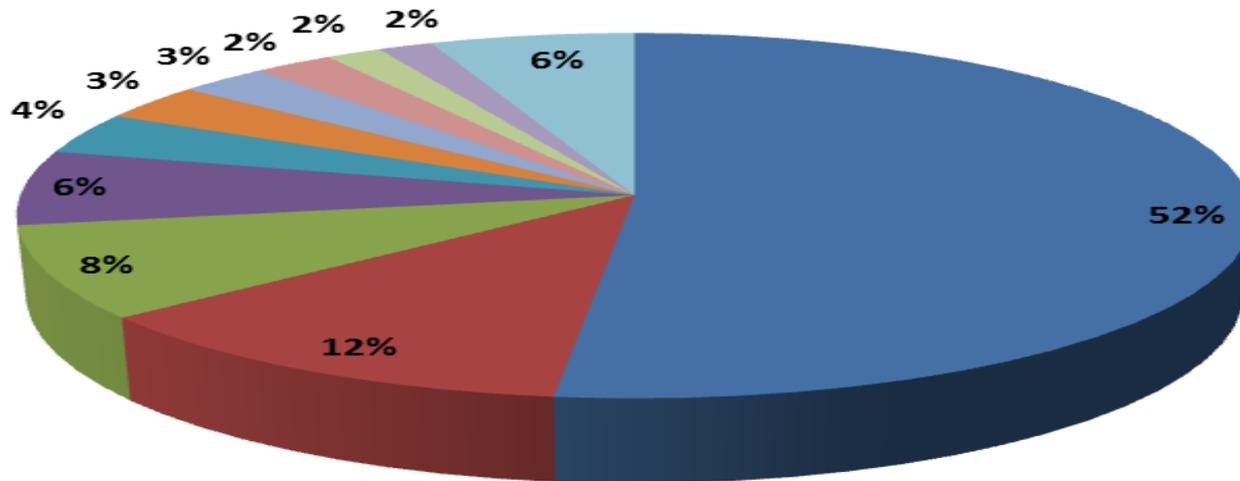


# Decoupling of emissions from economic growth

## 6. There is evidence of some decoupling of economic growth from carbon emissions in the region

- Emissions dropped by 11% since 2000
- GDP grew at 3% average
- This is mainly the result of reduced deforestation and improvements in efficiency of energy use

LAC Emissions, Country Breakdown, 2005

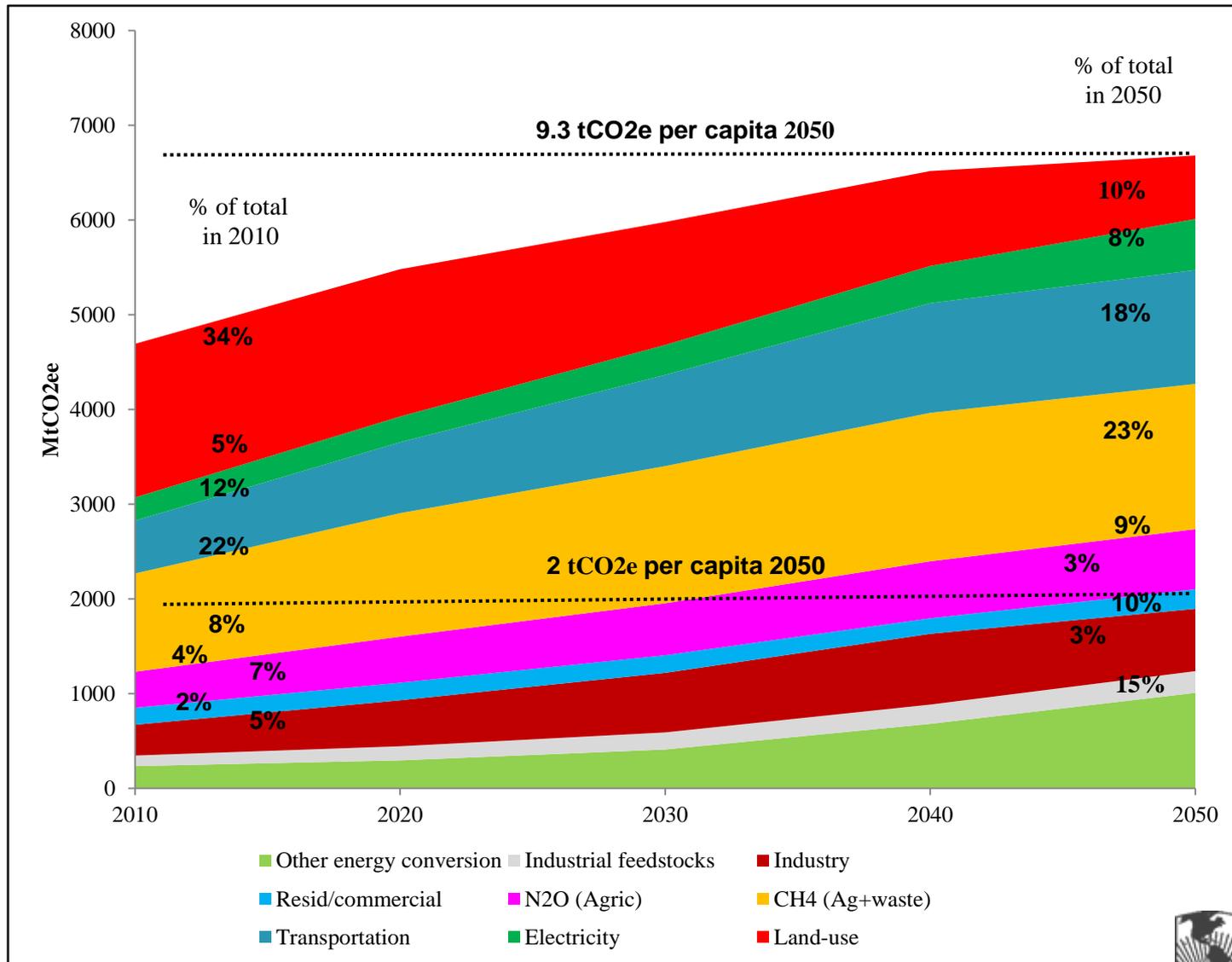


- |             |              |             |
|-------------|--------------|-------------|
| ■ Brazil    | ■ Mexico     | ■ Venezuela |
| ■ Argentina | ■ Bolivia    | ■ Colombia* |
| ■ Peru      | ■ Ecuador    | ■ Guatemala |
| ■ Chile*    | ■ All others |             |

Source: Own elaboration based on WRI-CAIT data.



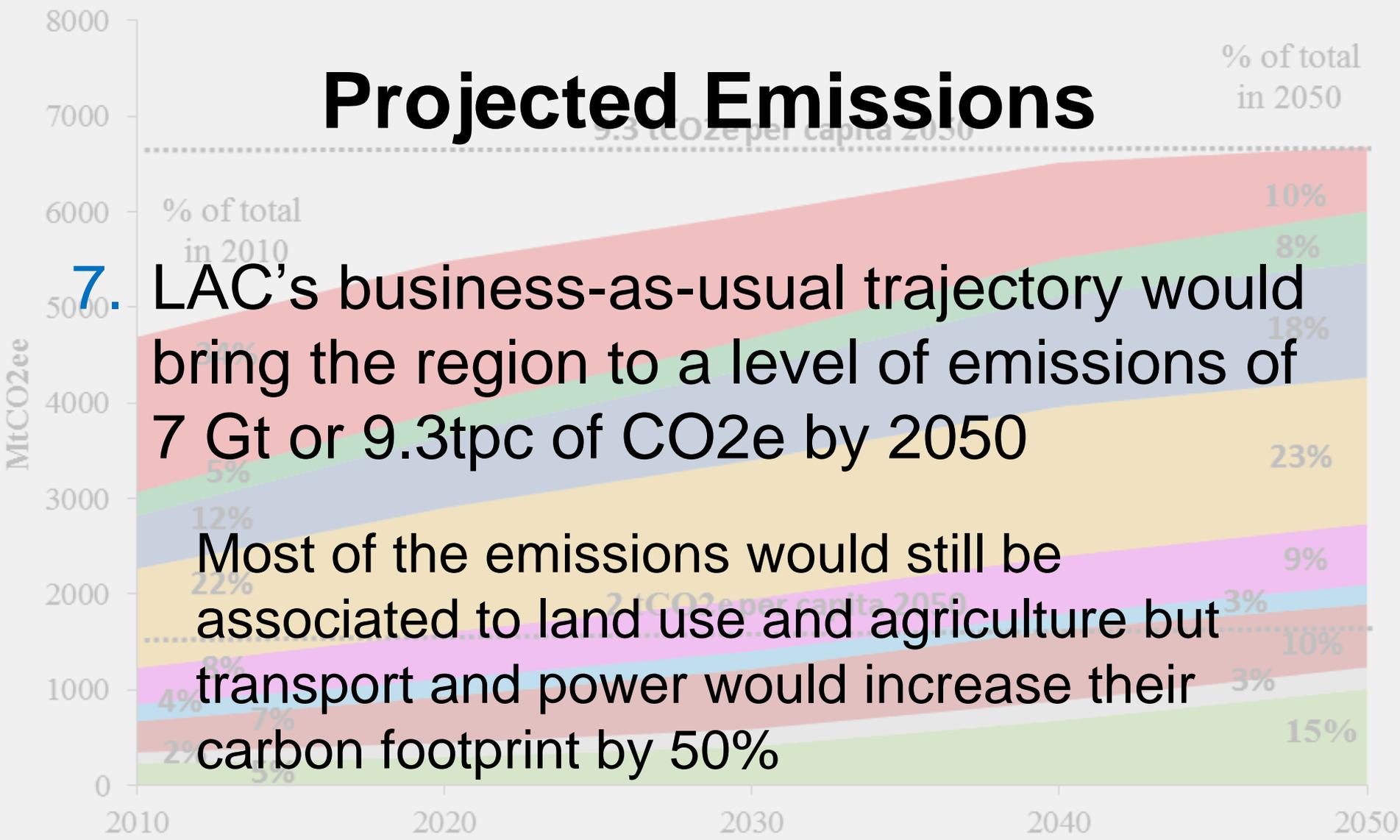
# Business as usual scenario



# Projected Emissions

7. LAC's business-as-usual trajectory would bring the region to a level of emissions of 7 Gt or 9.3tpc of CO2e by 2050

Most of the emissions would still be associated to land use and agriculture but transport and power would increase their carbon footprint by 50%



- Other energy conversion
- Industrial feedstocks
- Industry
- Resid/commercial
- N2O (Agric)
- CH4 (Ag+waste)



# Mitigation Pathways

## 8. Mitigation efforts, including both land-use and energy actions, are essential to achieve the intermediate stabilization goal of 2tpc by 2050

Zero net deforestation by 2020 and zero net land-use emissions from 2030

Net accumulation of carbon sinks from 2030 onwards

100% share of LAC power mix from low carbon sources

40% improvement in energy efficiency

Reduction of emissions from agriculture by 50%

Arrest and reverse the current carbonization path of the regional power matrix with 70% zero carbon installed capacity by 2050

Widespread electrification of the transport sector



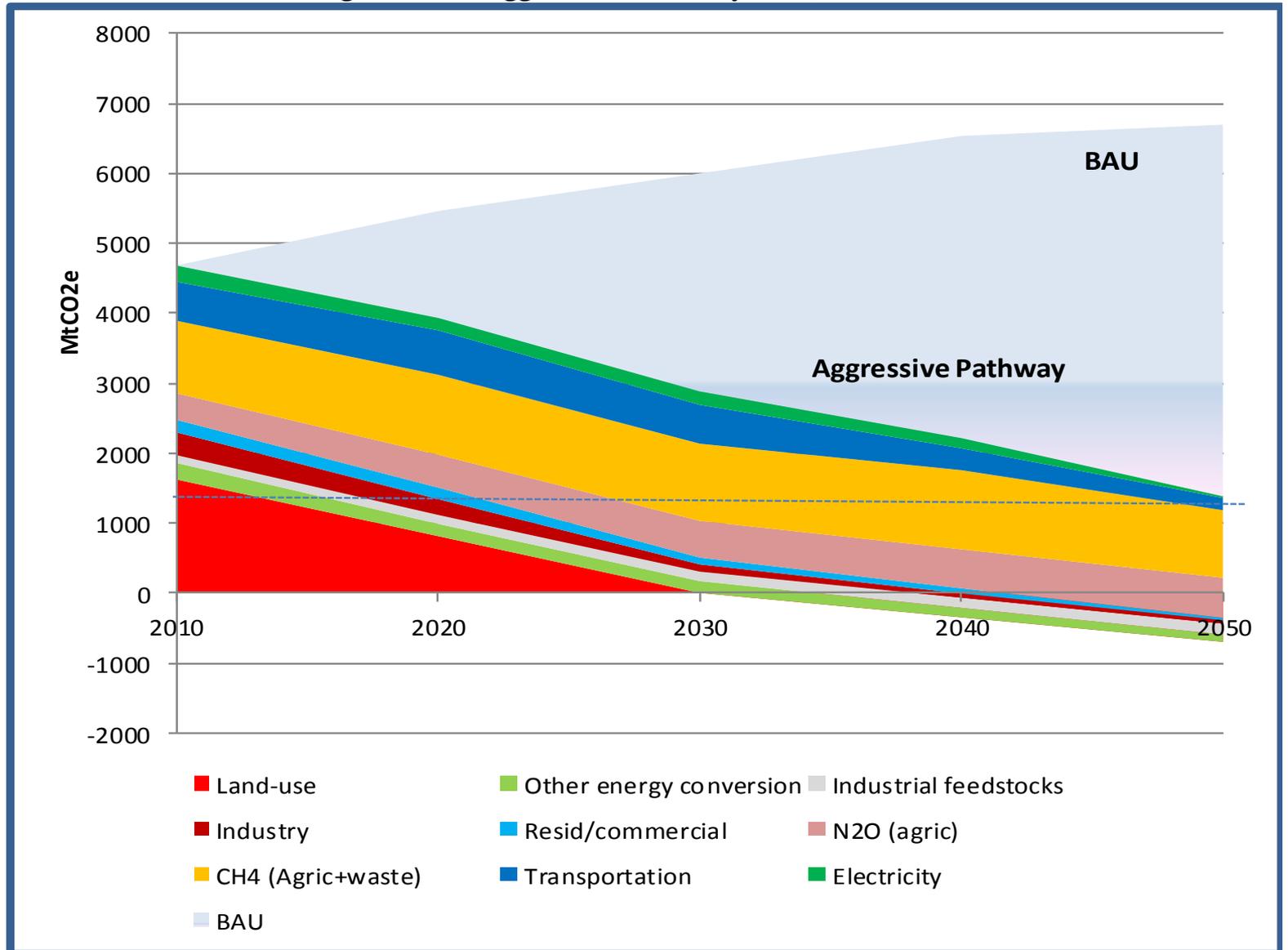
# Cost of reaching 2 tpc

9. The net additional financial cost to LAC of a pathway that reaches 2tpc by 2050 is estimated to be approximately US\$110 billion per year by 2050.

This represents net abatement cost of US\$20 per tCO<sub>2</sub>e by 2050

Net of investments included in BAU.

Figure 11. " Aggressive Pathway I +", 2010-50



Source: Version 2.0.rc1 of the GEA Scenarios Database of the International Institute for Applied Systems Analysis (IIASA), and own elaboration



# Climate Change Actions

10. Adaptation and mitigation activities generate significant development co-benefits,

Improved health and welfare,

Enhanced food and energy security

Technology development

Sustainability in development activities

but these are local and frequently do not seem enough to guarantee the removal of barriers to act against climate change

# PLAN OF ACTION: ADAPTATION

- Adaptation is priority one
- Position IDB as agency of choice in the region (diversify funding options, provide technical leadership, support long-term approach)
- Focus on impacts on: agriculture, water supply, coastal zones, ecosystem integrity

# PLAN OF ACTION: MITIGATION

- Support efforts to:
  - zero out deforestation
  - commit to zero carbon entries in power matrix
  - facilitate entry of zero carbon transport systems; and
  - deploy low carbon practices in agriculture