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## Regional GHG reduction targets based on effort sharing: a comparison of studies

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■ synthesis article

## **Regional GHG reduction targets based on effort sharing: a comparison of studies**

NIKLAS HÖHNE<sup>1,2\*</sup>, MICHEL DEN ELZEN<sup>3</sup>, DONOVAN ESCALANTE<sup>1</sup>

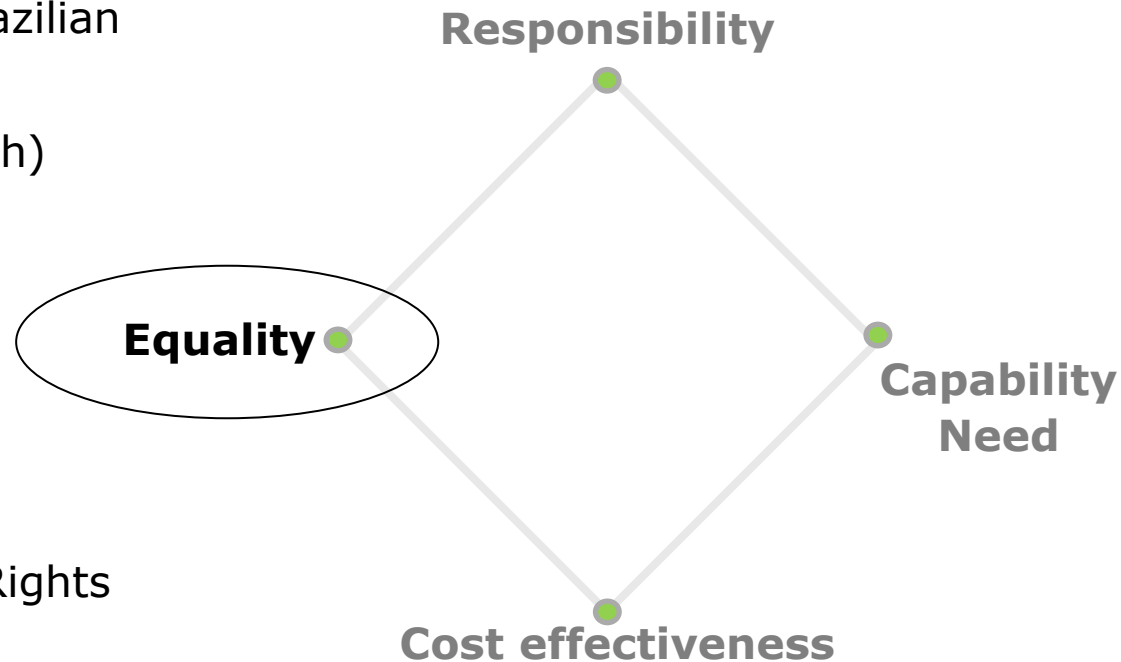
# History of effort sharing approaches

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- > Run-up to Kyoto
  - „Contraction and Convergence“
  - Historical responsibility „Brazilian Proposal“
  - Mitigation potential (Triptych)
  - Multicriteria formula
- > Run-up to Copenhagen
  - Basic needs principle
  - Capability (GDP/capita)
  - Staged approaches
  - Greenhouse Development Rights
- > Recently
  - Carbon budgets (BASIC experts)

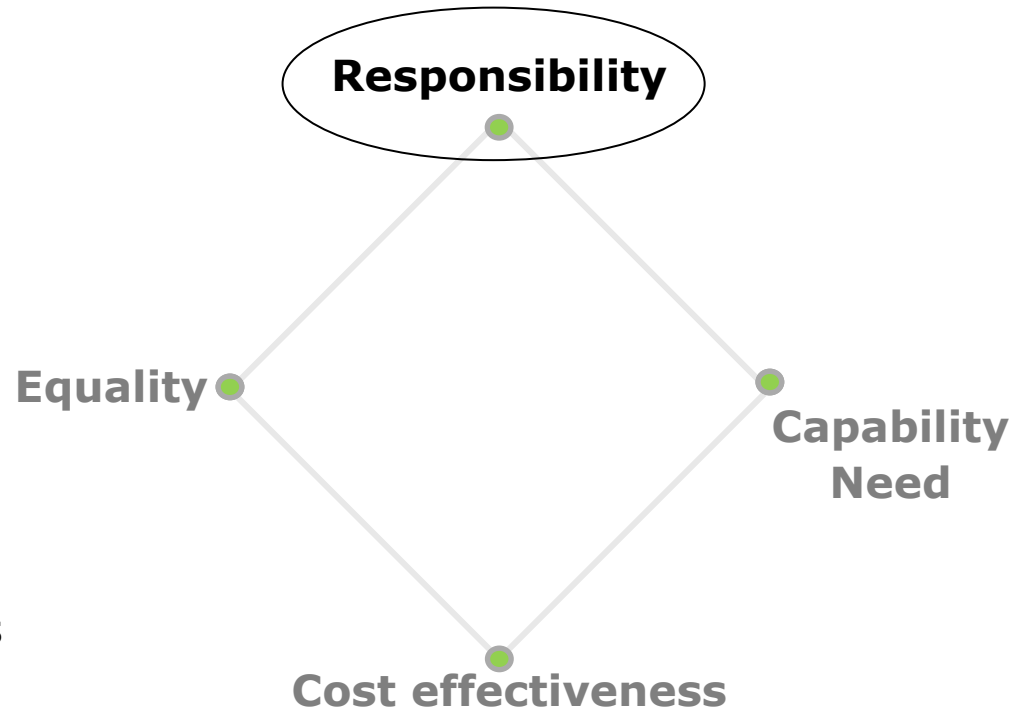
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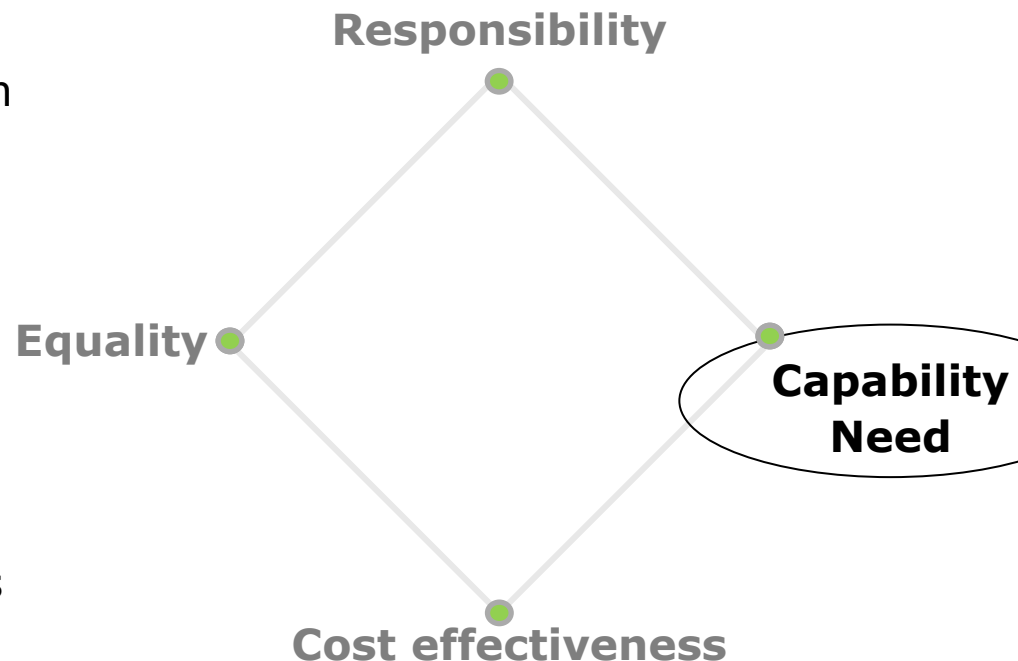
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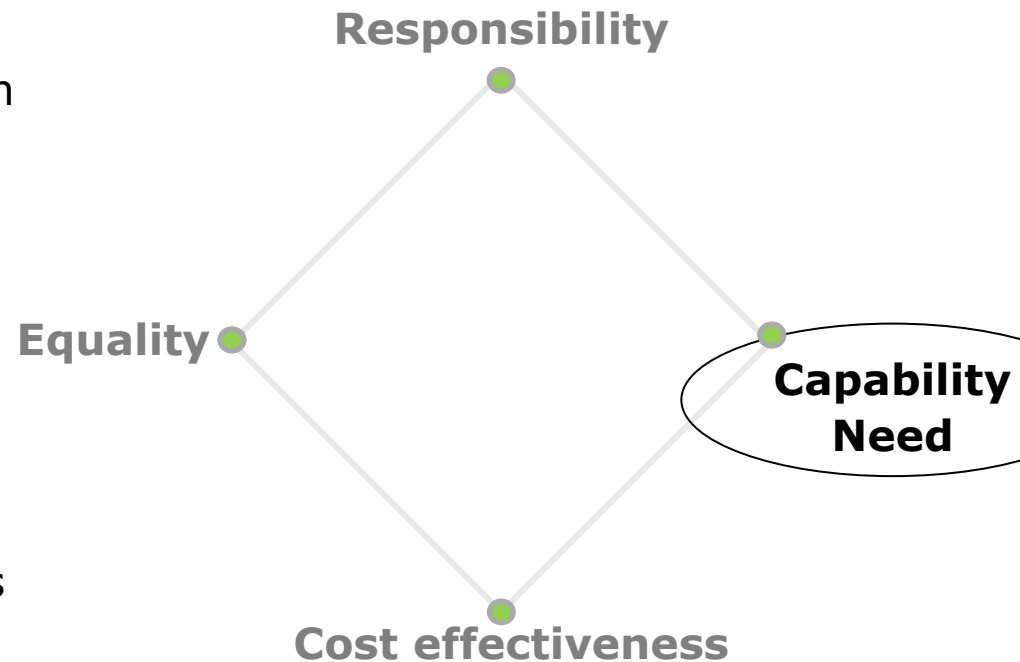
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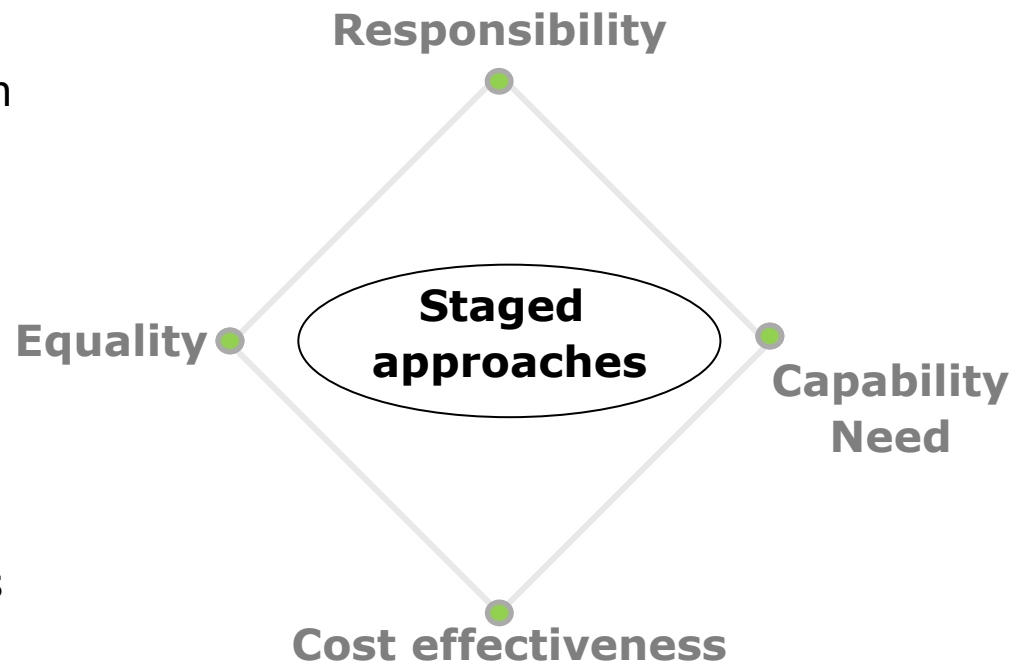
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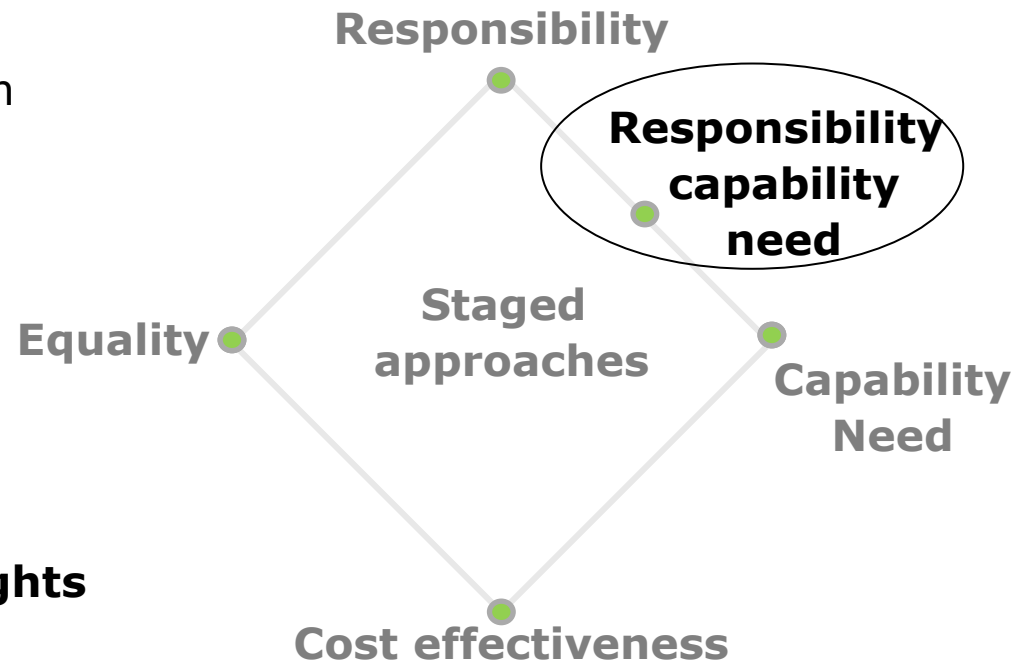
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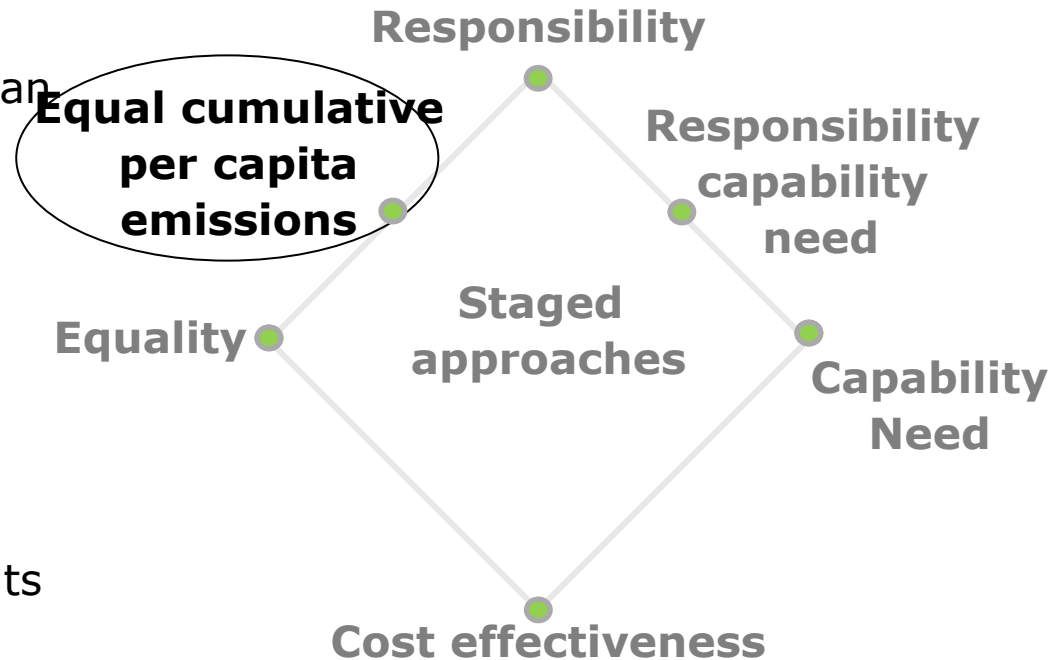
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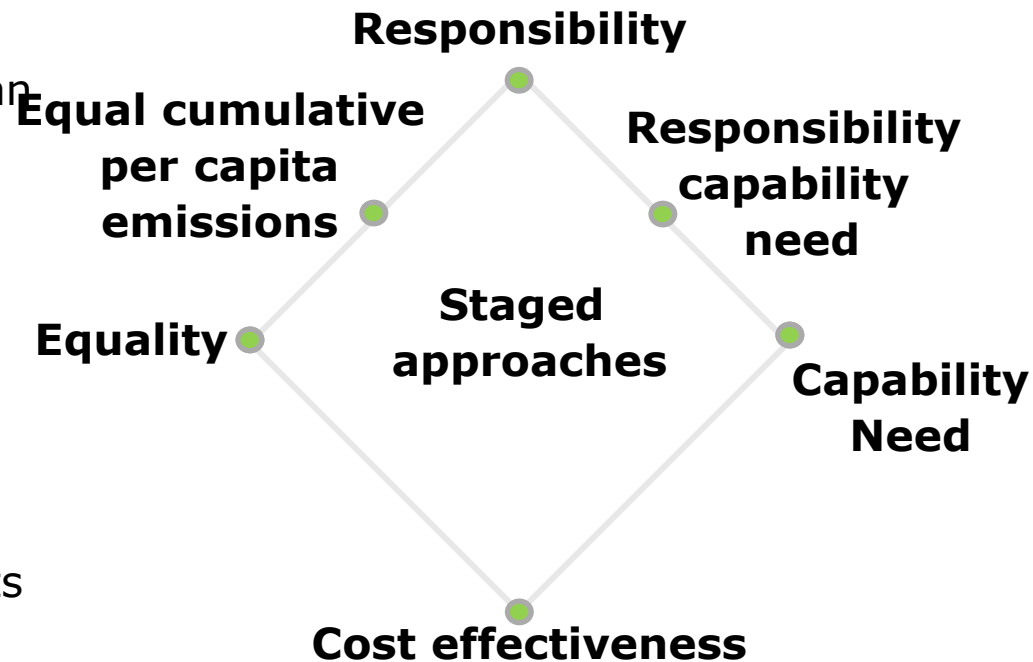
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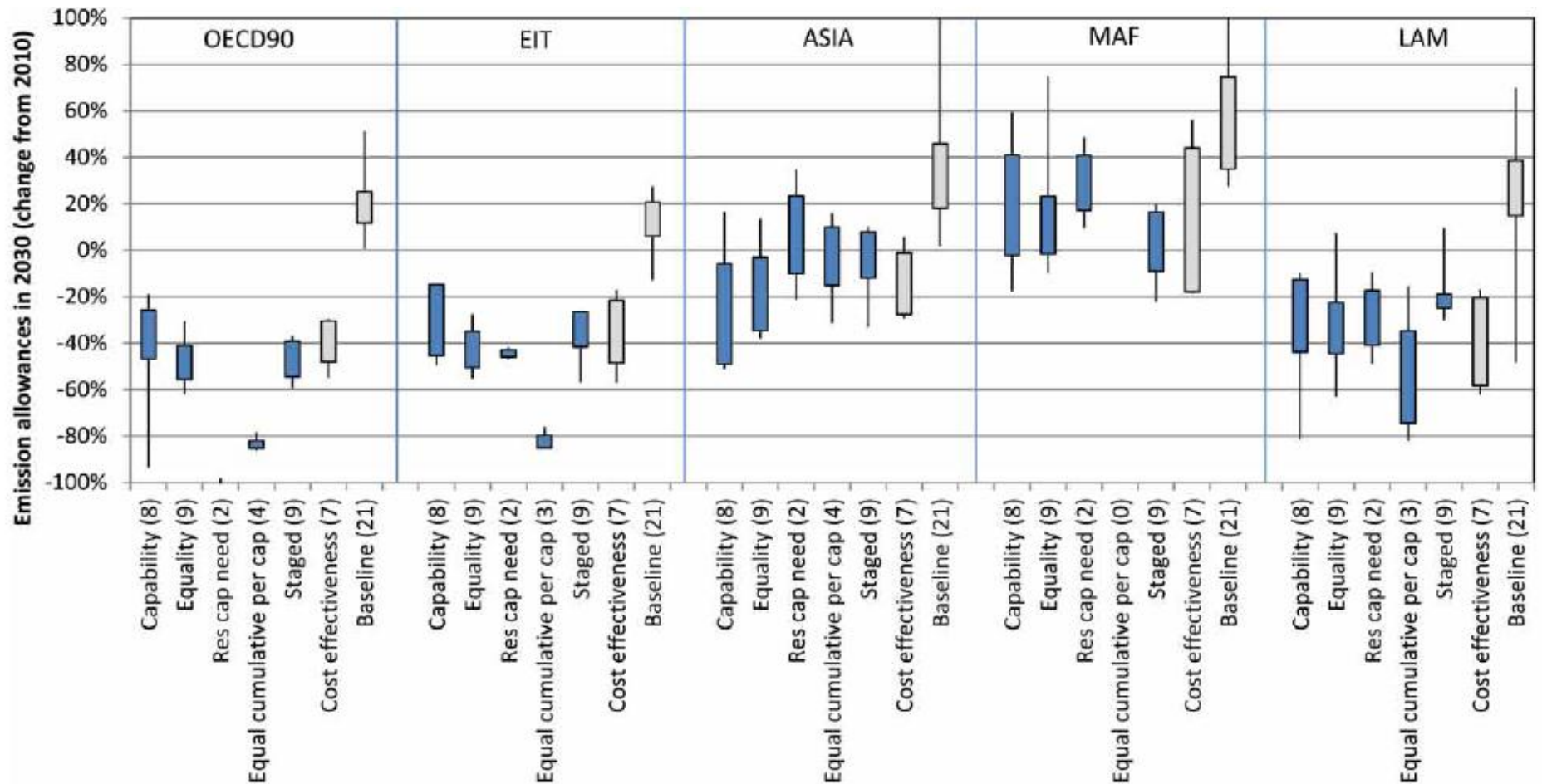


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# Results in 2030 for 450 ppmCO2e



**Allowances in 2030 based on categories of effort sharing categories (450 ppmCO2e)**

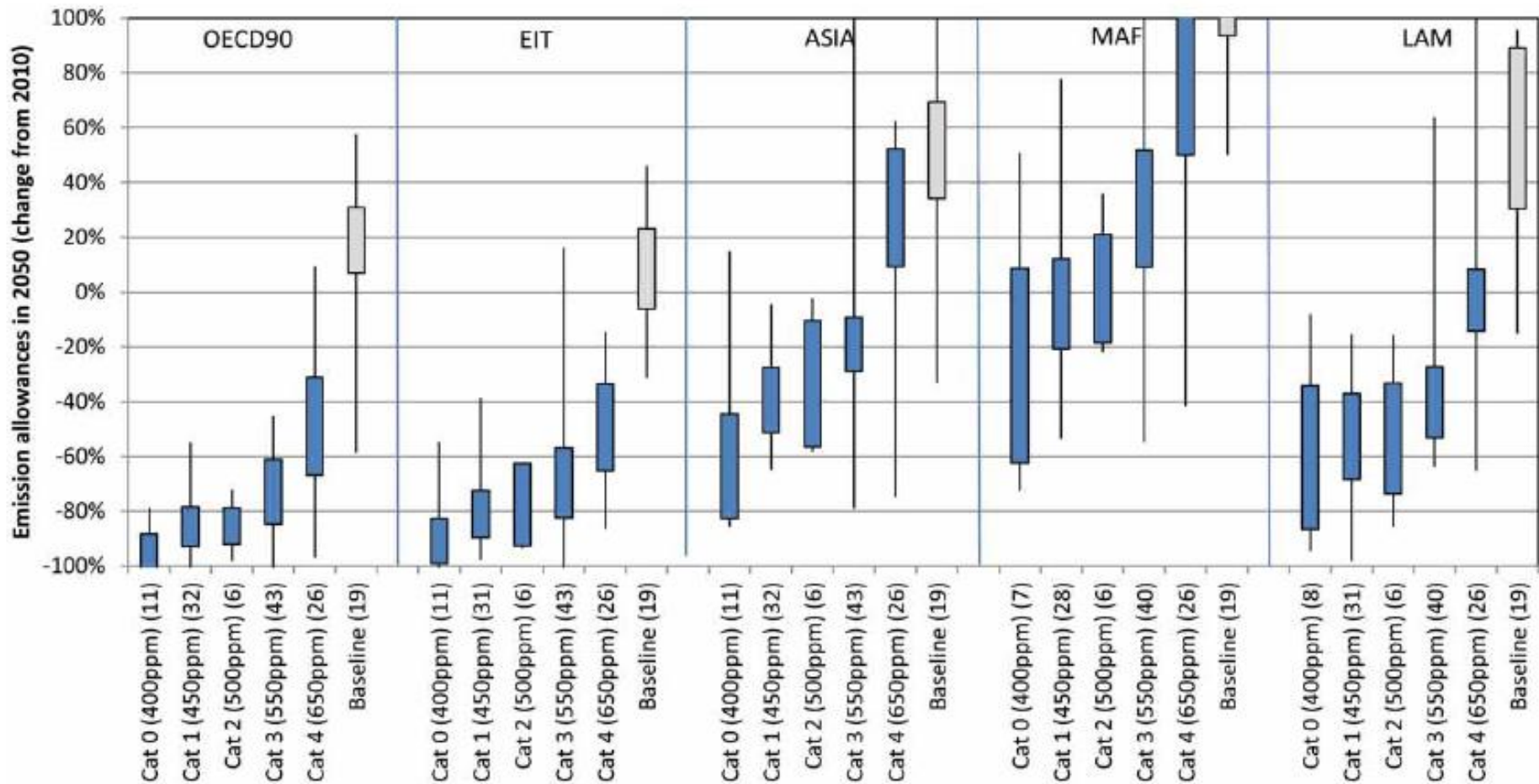
# Results in 2030 for 450 ppmCO2e

**TABLE 4** Emissions allowances over all allocation categories for Category 1 in 2030 relative to 2010 and 1990 emissions<sup>2</sup>

	OECD1990		EIT		ASIA		MAF		LAM	
As change from 2010	- 37%	- 75%	- 28%	- 53%	7%	- 33%	24%	- 7%	- 15%	- 49%
As change from 1990	- 33%	- 74%	- 52%	- 69%	100%	25%	159%	95%	- 3%	- 41%

Notes: Including the studies for cost-effectiveness would change the results (in particular for the OECD), towards - 32% to - 60% relative to 2010, instead of - 37% to 75%.

# Results in 2050



**Allowances in 2050 for different stabilization levels (all effort sharing categories, except cost effectiveness)**

# Conclusions

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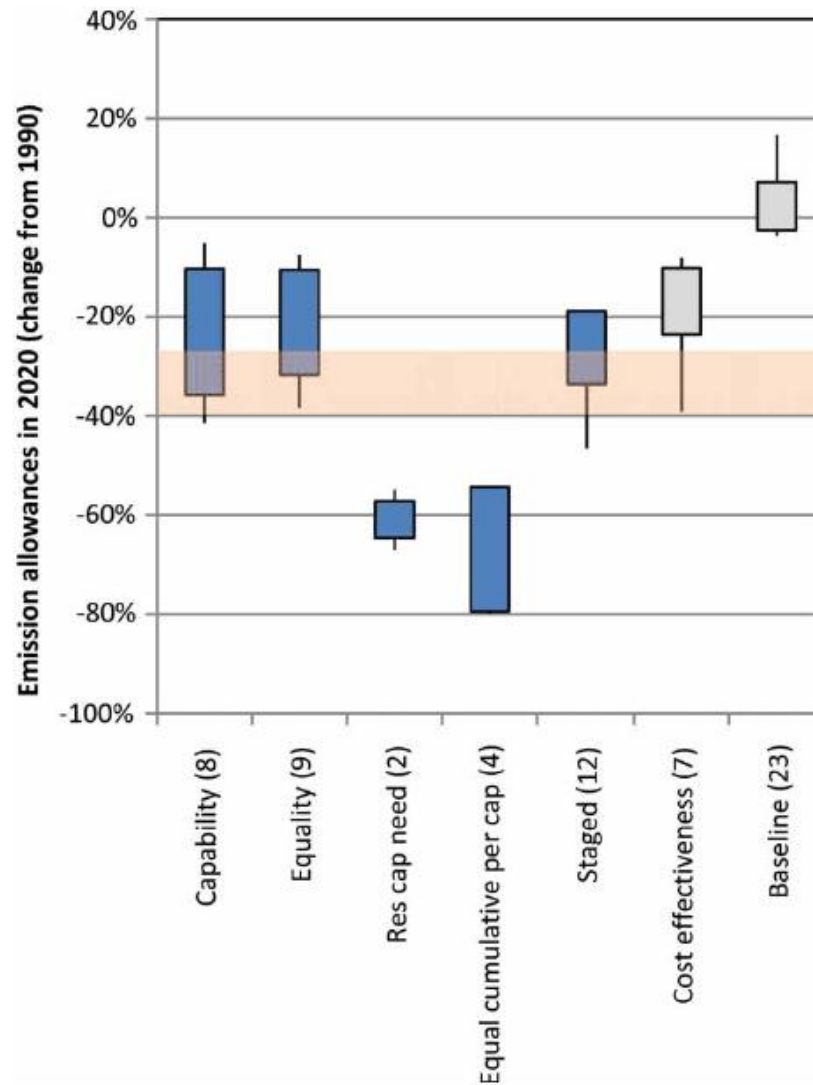
- > **Large range within effort sharing categories:** outcome determined by the way the equity principle is implemented
- > **Differences from effort sharing categories**
  - For the OECD1990 region proposals in the category 'Responsibility, capability, and need' and those based on 'Equal per capita cumulative emissions' lead to relatively low allocations
- > **Allowances in 2030** for 450 ppmCO<sub>2</sub>
  - OECD1990: on the order of half of the emissions of 2010
  - EIT roughly two-thirds
  - ASIA group approximately at the 2010 emissions level or slightly below, with significant differences for South Asia, East Asia, and Pacific Asia.
  - MAF would be slightly above the 2010 level
  - LAM would be below the 2010 level
- > For many regions, the **choice of stabilization level** was of equal or greater importance for the resulting emission allowances than the choice of effort-sharing approach, in particular for 2050.
- > Significantly more studies are available but we suggest **a modelling comparison exercise** to ensure consistency and comparability of results



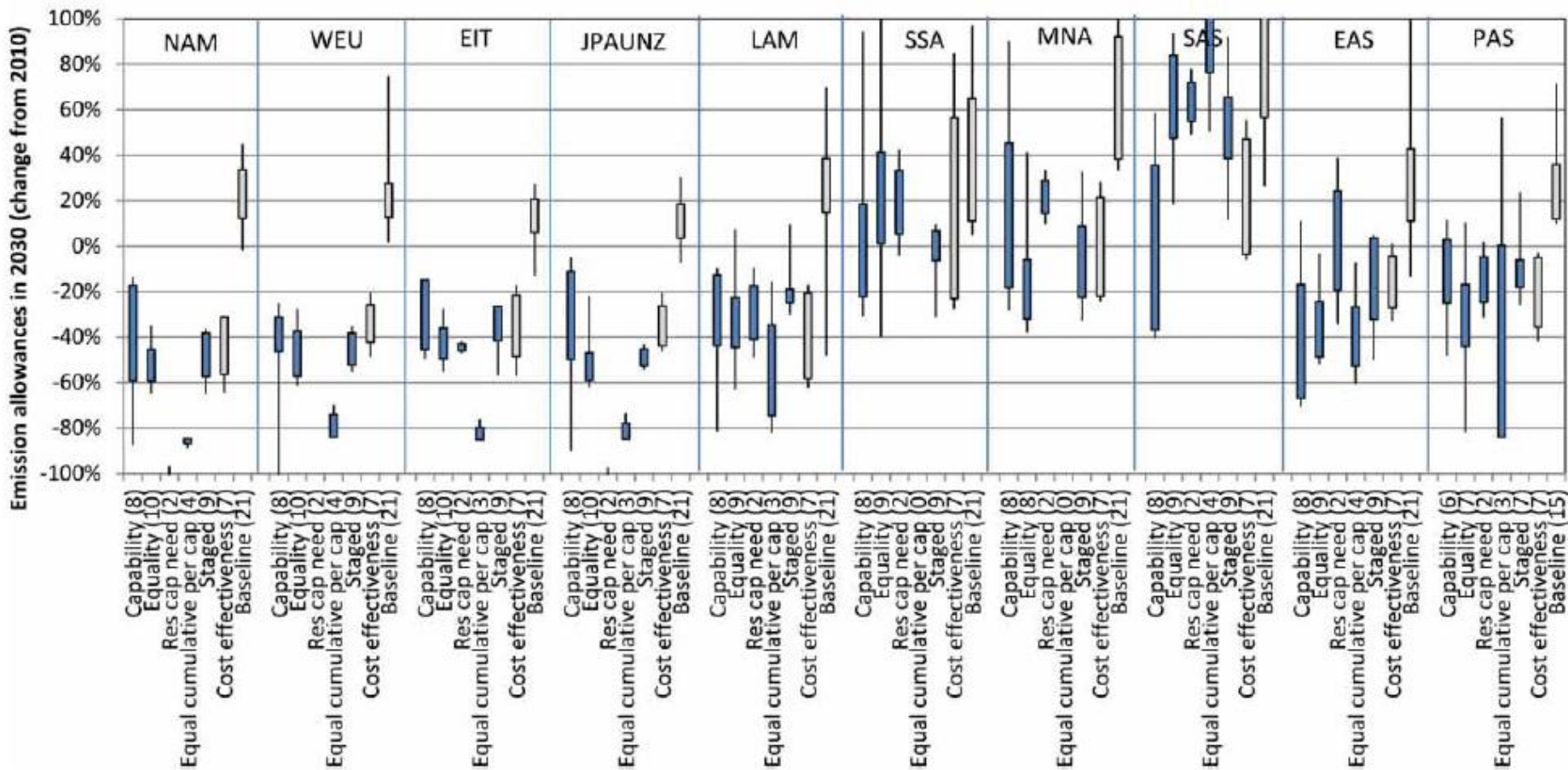
# Backup slides

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# Allowances in 2020 for Annex I countries

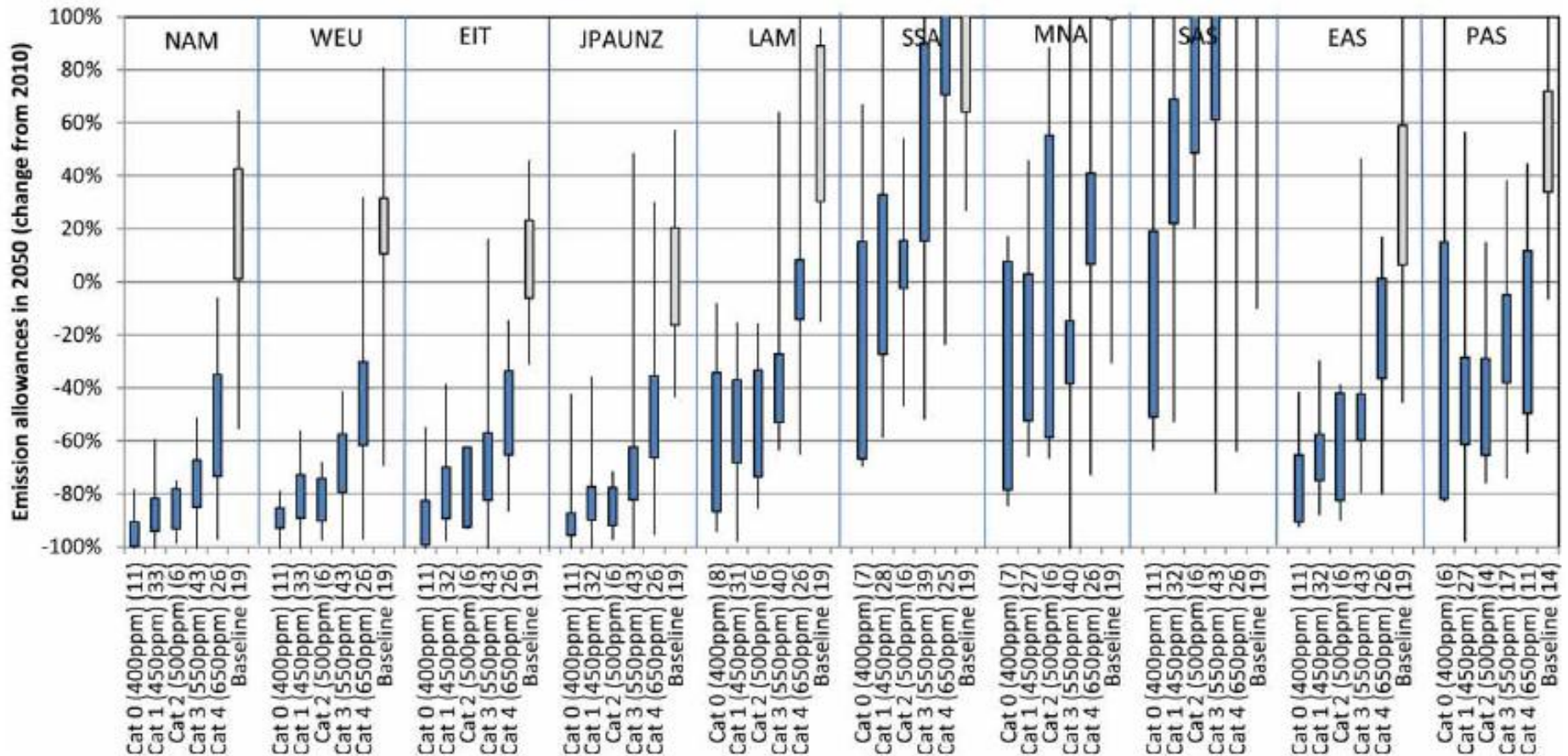


# Results



**Allowances in 2030 based on categories of effort sharing categories (450 ppmCO<sub>2</sub>e)**

# Results in 2050



**Allowances in 2050 for different stabilization levels (all effort sharing categories, except cost effectiveness)**