

Effective Policies Against Climate Change

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Efficiency and Equity

■ Efficiency

- Temperature target at **lowest economic costs**
 - Uniform **carbon price**, or
 - Emission **trading system**

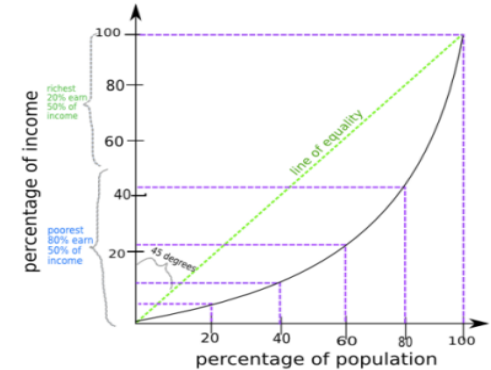
■ Equity

- Fair **burden sharing**
 - **Acceptance** of agreement
 - Raise **ambitions** to reach efficient target
 - Guideline for **evaluation** of country pledges
- **Equity impact of** policies



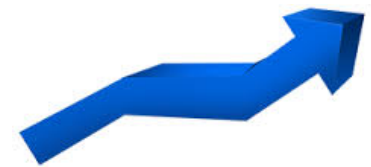
Climate and Distribution

- Climate **change** and **policies**
 - Major distributional impacts
- World **income distribution**
 - **Without any policy**, less developed and vulnerable countries will suffer disproportionately
 - **With stringent climate policies**, carbon-intensive countries expect a substantial policy burden
- Country level
 - Climate policies should be **part** of a fair system



Climate Policy Costs

- Climate policy costs are moderated by
 - **Economic dynamics** -> decision makers tend to focus on the short run
 - **Uncertainty** -> with risk aversion, a rational response to uncertainty is to reduce it
 - **Secondary benefits** -> Health, regional environment, induced innovation, employment
- Country policy cost
 - Affected by international **burden sharing**
 - Ideal metric for **burden sharing**: comprehensive, measurable, replicable, and universal



Common but Differentiated Responsibilities



- How to make it **operational?**
- **Focal points**
 - Part of everybody's general **expectations**
 - Suitable to build **acceptance and trust** among the negotiating partners
 - Context of fairness: **equity principles**
- **Basic equity principles**
 - Common **understanding** already exists
 - Broadly **implemented** in national public policies
 - Uniform **carbon price** has equity impacts as well

Equity Principles



- **Ability to pay:** the larger the economic **capacity** of a country, the more it should contribute to global policy
- **Policy cost sharing:** the lower a country's **costs of the policy**, the more it should contribute
- **Merit principle:** the bigger the **efforts** of a country to solve the underlying problem, the more it should be rewarded (-> advancing carbon-efficient technologies)
- **Comparing like with like** -> emissions at times of abundant alternative energy sources are weighted differently from emissions at times of few **alternative energy sources**

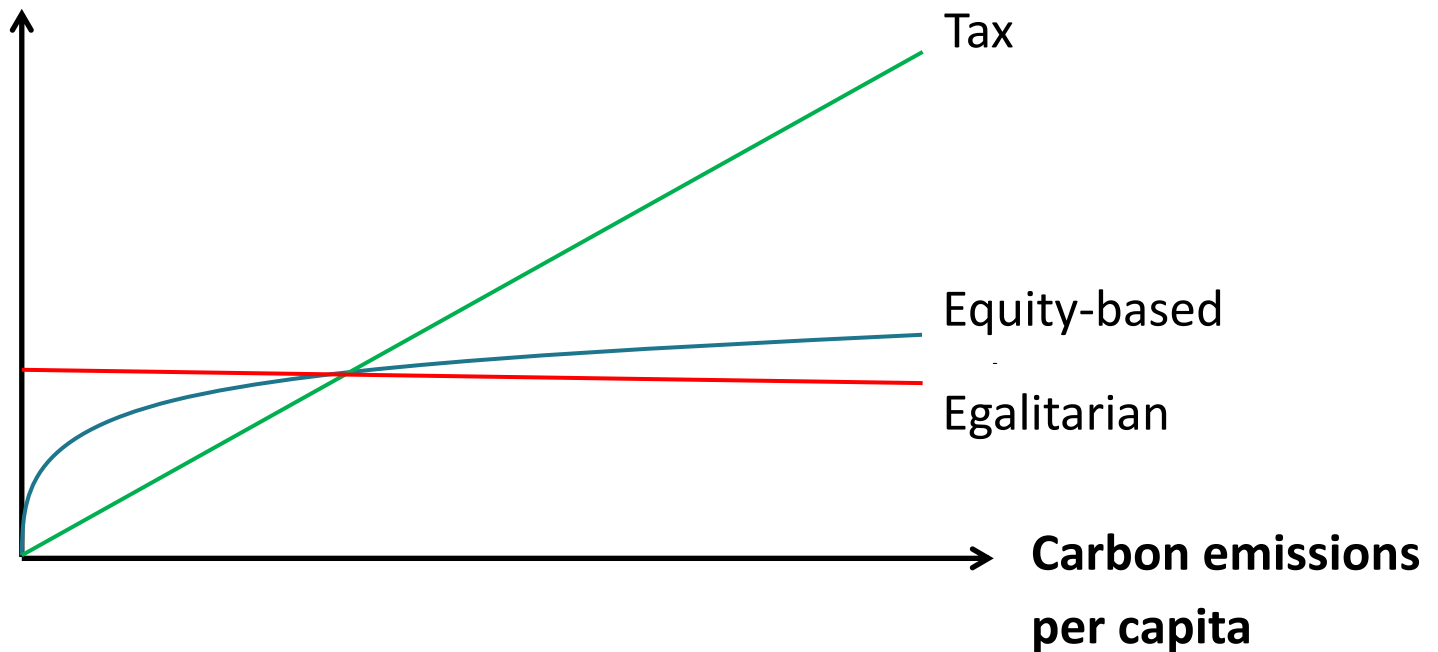
Equity-Based Climate Policy

- Equity-based burden sharing: use of four basic **equity principles**
- Alternative proposals
 - uniform **global carbon tax** with domestic use of tax revenues
 - **egalitarian carbon budget** per capita
- Comparison to current mitigation **pledges**



Policy Comparison


Country carbon
budget



- Equity-based policy is a **compromise**

ETH Climate Calculator

www.ccalc.ethz.ch



Home Introduction **Calculator** Technical Explanation

Instructions Results overview Plots

General parameters

CO₂ budget (2000-2050) ⓘ
Scenario: Medium ▾

Number of countries ⓘ

n [1-194]

% E [0-100%] %

Specific parameters

Equity principles method ⓘ ⚙

[0-100%]

Ability to pay %

Cost sharing %

Tech. contribution %

Tech. development %

Check sum ⓘ %

Responsibility factor ⓘ ⚙

Factor [0-100%] %

Emissions since ▾

Calculate

General parameters

CO₂ budget: Choose one of the following scenarios of global carbon dioxide budget (See [detailed explanation](#))

Scenario	CO ₂ budget (2000-2050)	Probability of temperature increase < 2°C
Strict	1000 GtCO ₂	75%
Medium	1440 GtCO ₂	50%
Soft	1600 GtCO ₂	> 33%

Number of countries : Choose the number of countries (n) or the percentage (% E) of global emission covered by the n countries; countries are ranked according to their emissions in 2014 (see [detailed explanation](#)).

Method specific parameters

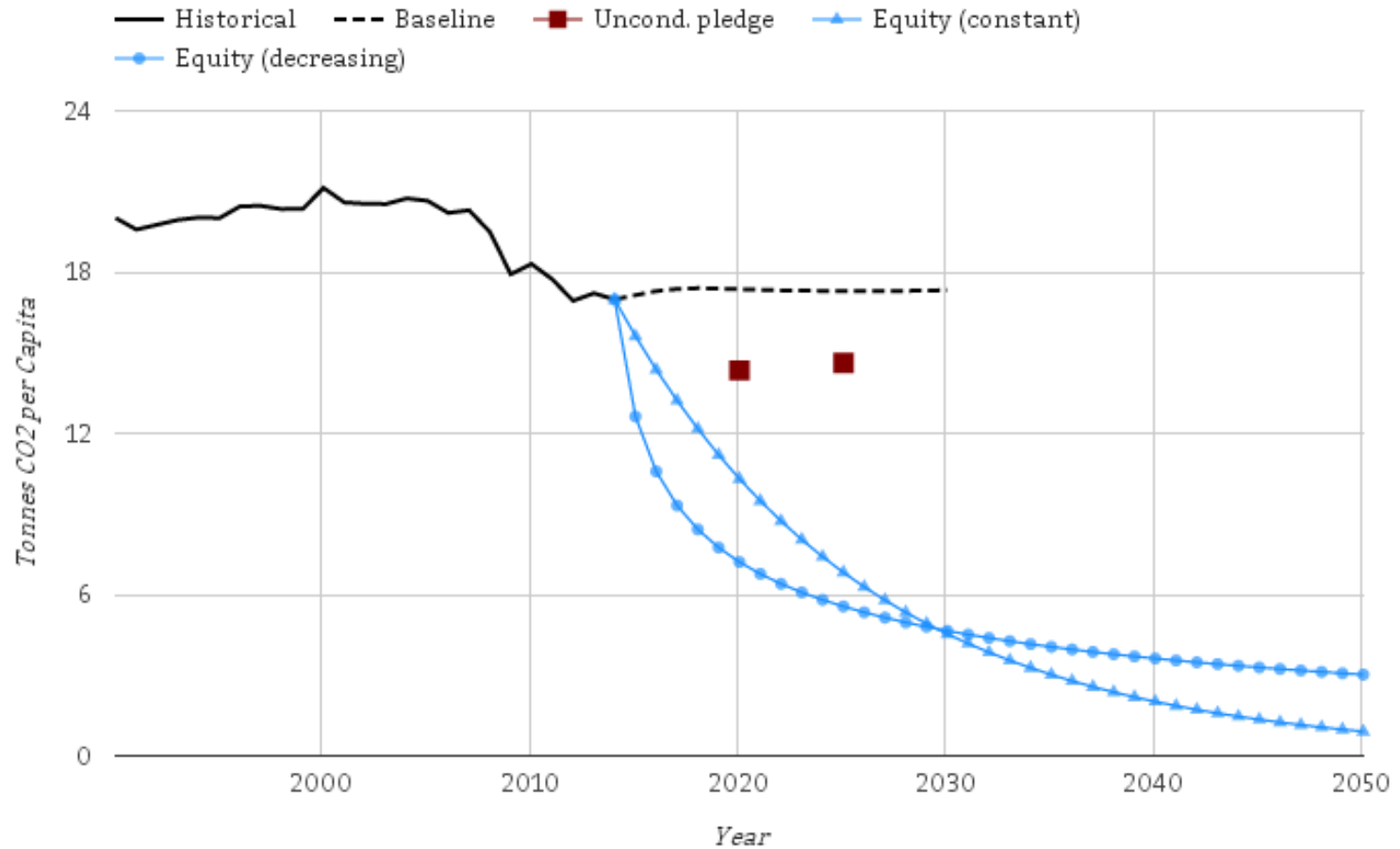
Our calculator presents three different ways of calculating the country distributions of a global carbon budget: (1) [Equity principles method](#); (2) [Tax method](#); and (3) [Egalitarian method](#). Choose the method specific parameters for the equity principles and the responsibility factor (used in equity principles and egalitarian methods).

Calculate

Once all fields are filled in, just press compute and a table with the results for the selected countries will appear.

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Country Example



Decisions: Bottom Up, Top Down

■ Bottom Up

- + Confirmed commitments
- + Broad national circumstances
- Level of ambitions
- Fairness

■ Top Down

- + Global metric
- + Efficient solution
- National commitments
- Specific national circumstances



- Acceptance of an agreement
- Mechanism raising ambitions

Ambition Dynamics

**Temperature target:
Efficiency**

**Equity guidelines:
Fairness**

Country contributions

«Internal Incentives»

«Fairness Incentives»

Efficient and equitable agreement

Thank you!

www.resec.ethz.ch/people/brlucas