# Is green recovery enough?
# Analysing the impacts of post-Covid economic packages

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## 1 Introduction

Emissions pathways after COVID-19 will be shaped by how governments' economic responses translate into infrastructure expansion, energy use, investment planning and societal changes. This paper provides **novel evidence on the energy system and greenhouse gas (GHG) emissions implications of post-COVID recovery packages** by assessing the gap between pledged recovery packages and the actual investment needs of the energy transition to reach the Paris Agreement goals.

## 2 COVID-19 Economic Recovery Packages Screening and Modelling

Two different modelling frameworks are used to assess the impacts of green recovery packages: the **COFFEE-TEA IAM** suite of models and **PROMETHEUS** energy system model.

We depart from a baseline (CurPol) scenario framed within the Shared Socioeconomic Pathway - **SSP2**, but applying short-term regional GDP growth shocks due to COVID-19 based on:
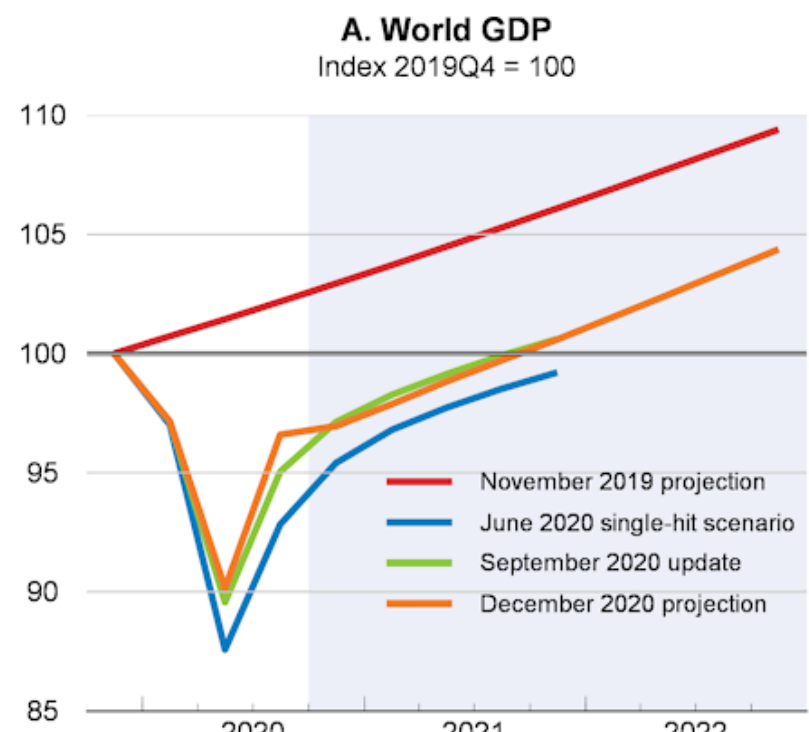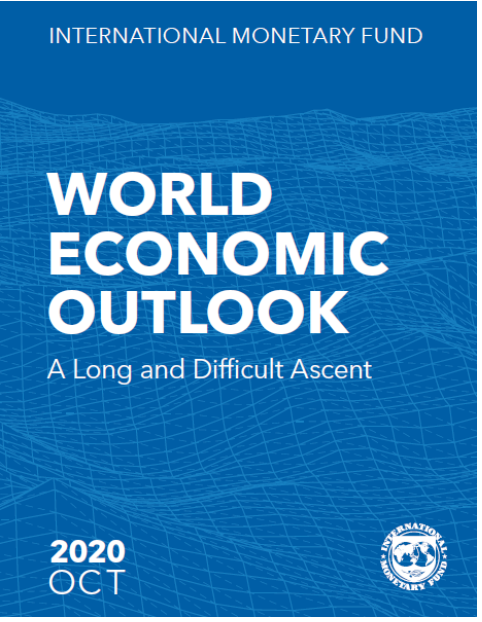
We screened **policy packages announced by governments up to May 2021** for investment in three main technology groups related to low-carbon transition (renewable energy, low-emission transport, energy efficiency).

The recovery packages were inserted in the modelling tools by changing specific model parameters, in particular by imposing **additional investment in low-carbon technologies** exogenously or by inserting subsidy rates in the capital costs to reduce the purchase price and accelerate the deployment of mitigation options.
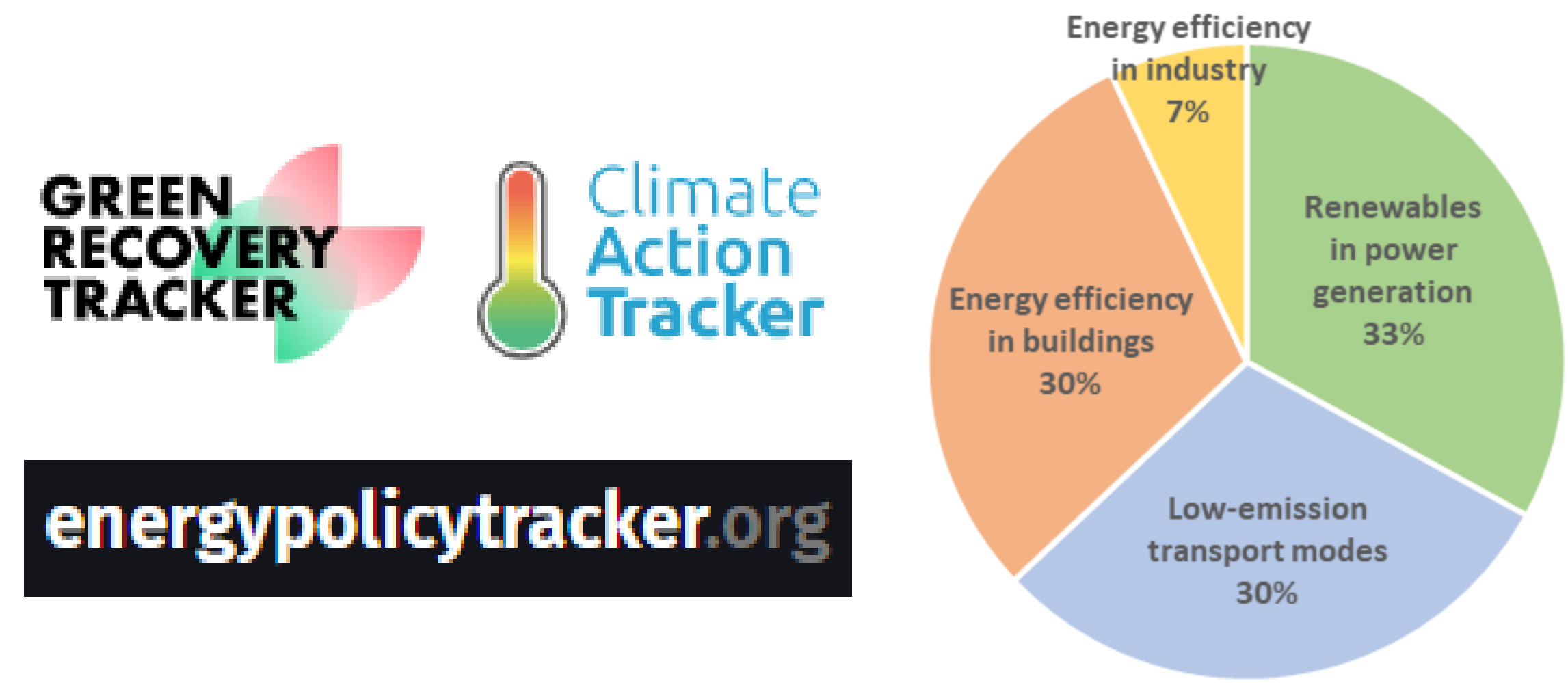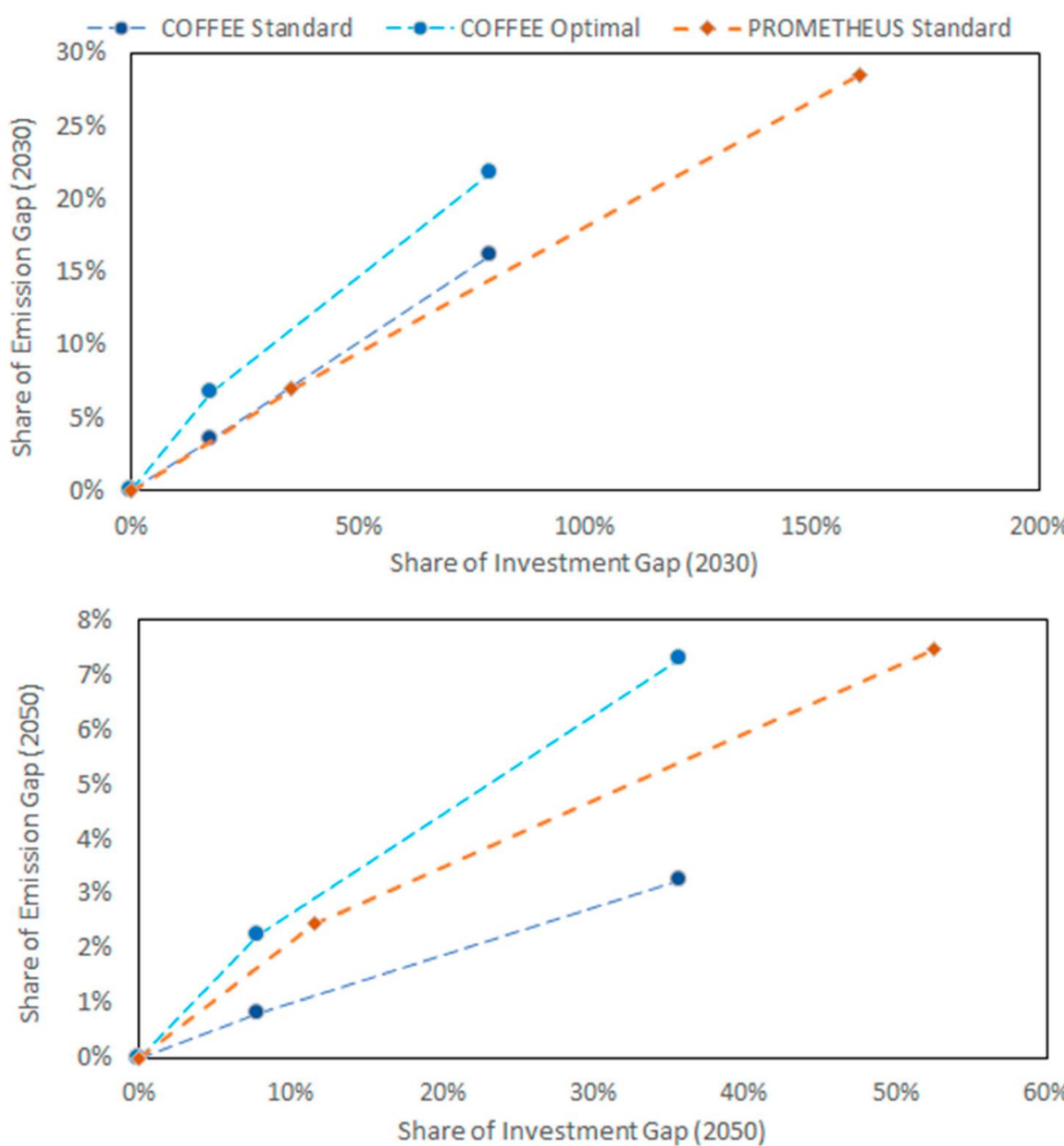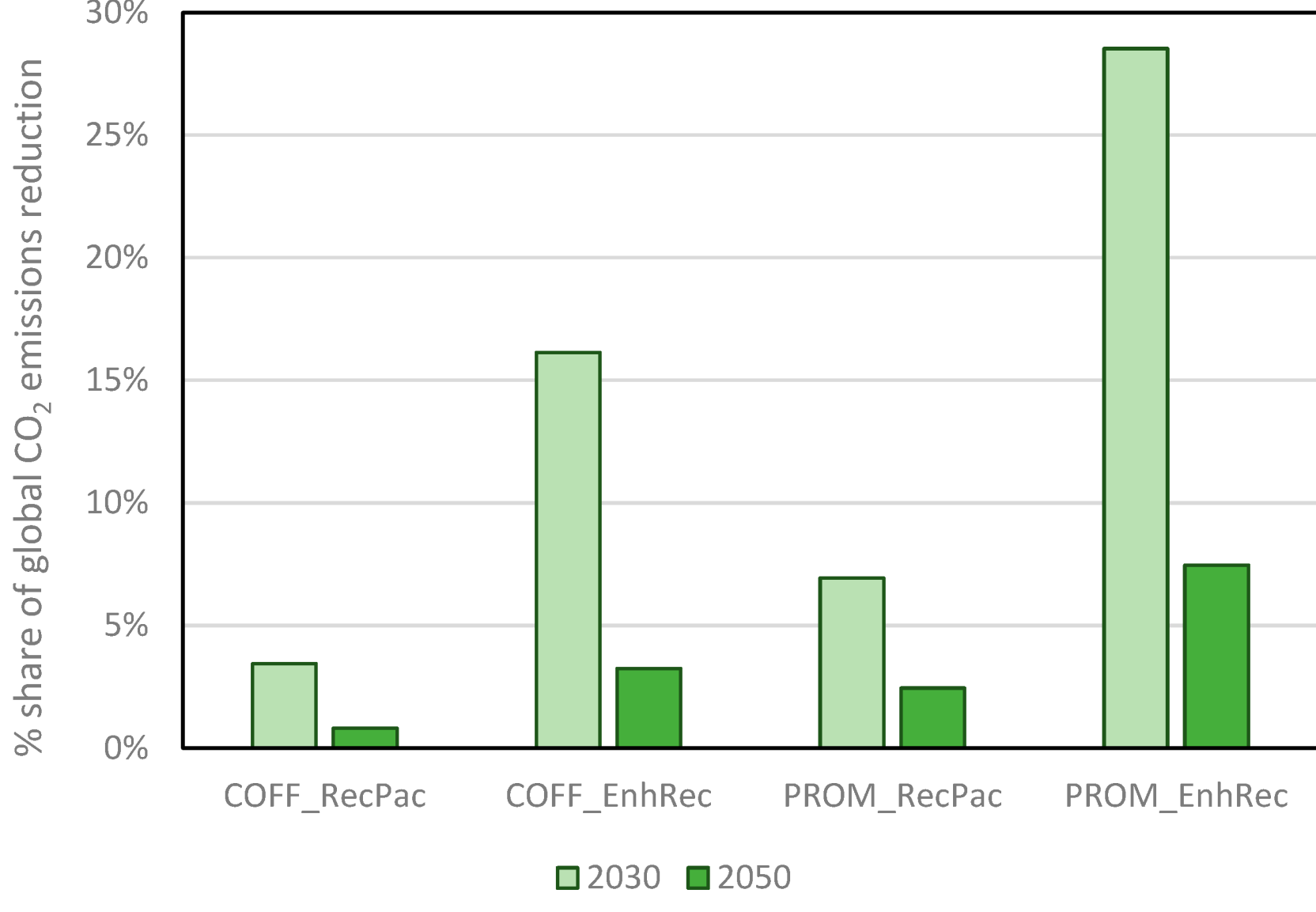


### Scenario design

We translate them into assumptions for each of the scenarios and their main **policy instruments**, and compare them with 1.5°C scenarios.

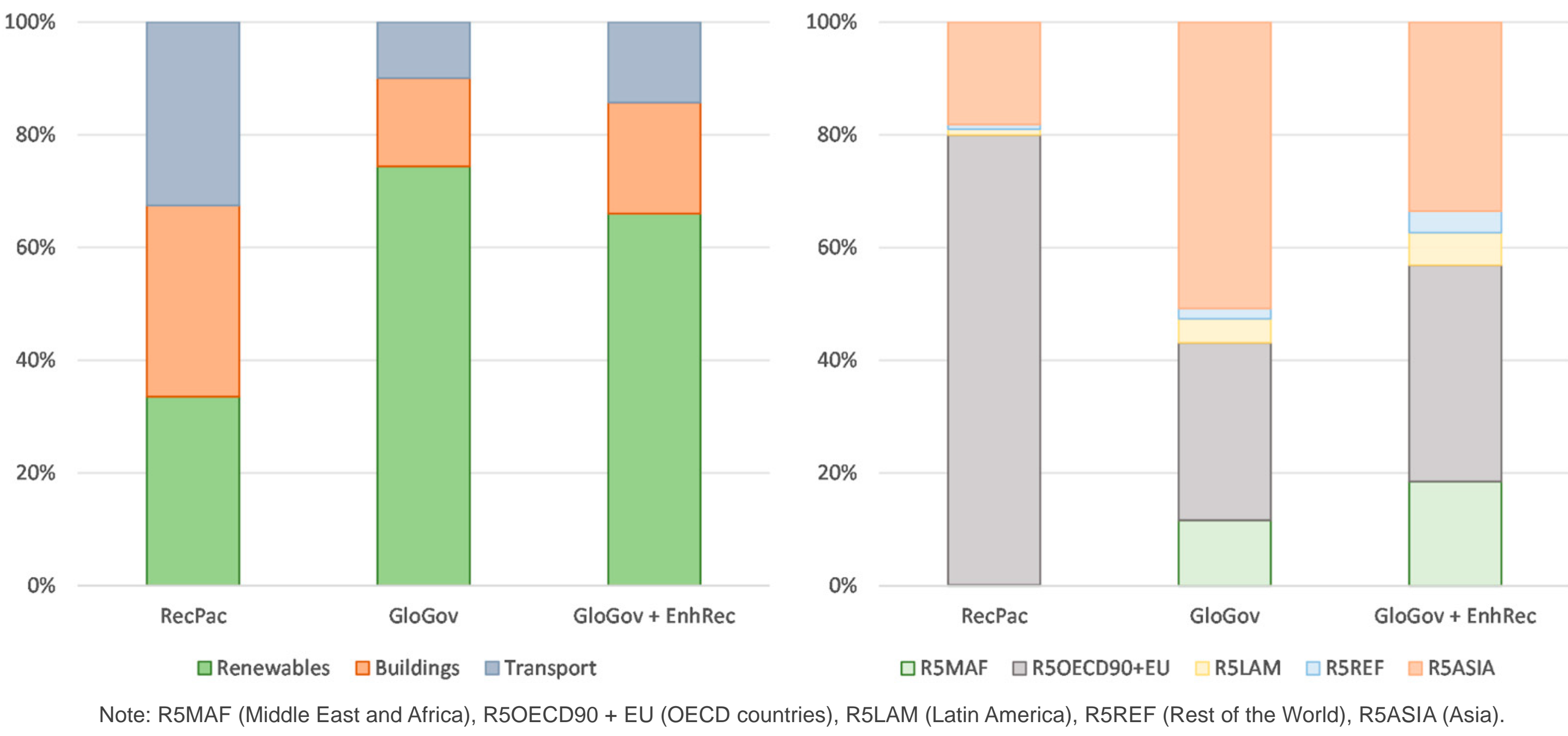| Scenario | Policy Instruments |
|---|---|
| Baseline (CurPol) | Current policies (no recovery packages) |
| Recovery Packages (RecPec) | CurPol + Recovery (direct investment, subsidies) |
| Enhanced Recovery (EnhRec) | CurPol + Enhanced recovery (5x recovery, direct investment, subsidies) |
| Climate Ambition (CliAmb) | Carbon pricing (600 GtCO$_2$ carbon budget w/o temperature overshoot) |
| Global Governance (GloGov) | CurPol + Direct investment, subsidies (modelling framework optimal choice at global level) |

## 3 Results

**Global CO$_2$ emissions pathway over the 2010-2050 period**
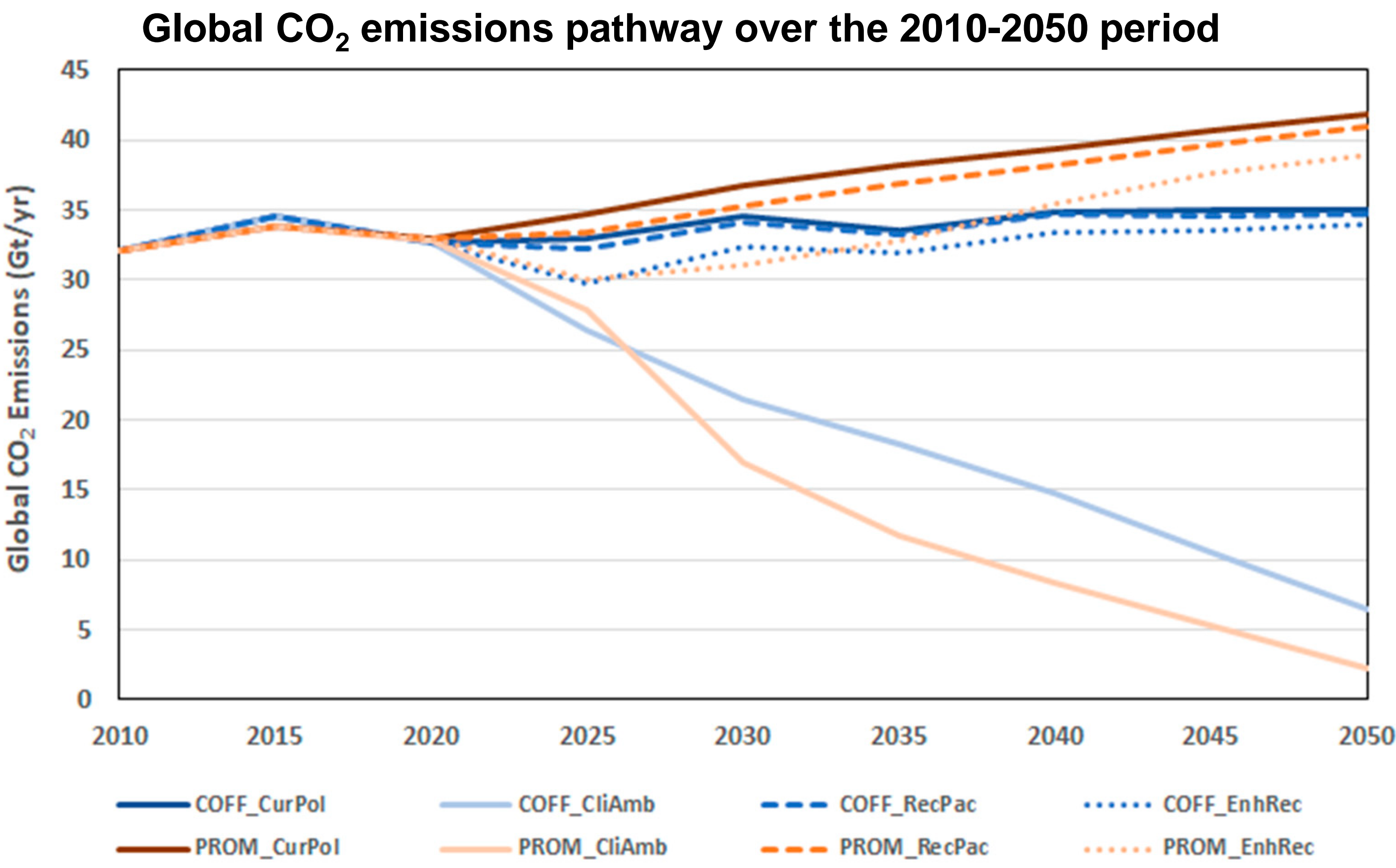


**Closing the ambition gap to achieve the 1.5°C target in 2030 and 2050**



**Investment allocation by sectors and regions under different scenarios**



Note: R5MAF (Middle East and Africa), R5OECD90 + EU (OECD countries), R5LAM (Latin America), R5REF (Rest of the World), R5ASIA (Asia).

## 4 Discussion and Conclusions

• Recovery packages stimulating investment in clean energy and energy efficiency can **reduce global CO2 emissions** by 10-13% in 2025 and 6-15% in 2030 relative to the CurPol scenario.

• Green recovery packages provide more of an **investment gap closure** than an emission gap closure and can accelerate energy system transformation with higher uptake of renewable energy, EVs and energy efficiency until 2030.

• An *enhanced* green **recovery strategy would not be enough** to deliver the systemic long-term restructuring to pave the way towards carbon neutrality by 2050.

• Global **optimal allocation of recovery packages** yields a larger level of mitigation through larger shares of wind and PV power generation.

• **Carbon pricing schemes** combined with green recovery packages boost medium and long-term system transformations towards net zero by mid-century.