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Energy-economy implications of the Glasgow pledges

A global stocktake of COP26

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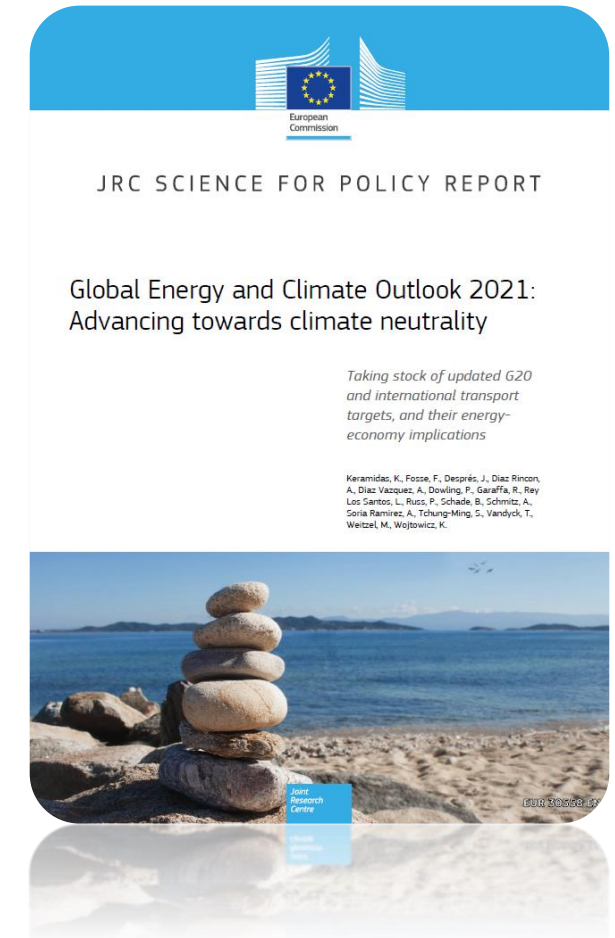
25th Annual Conference on Global Economic Analysis

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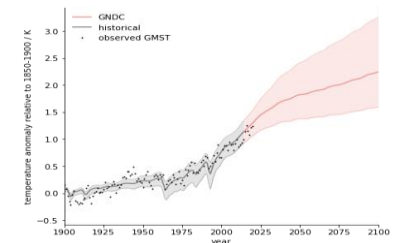
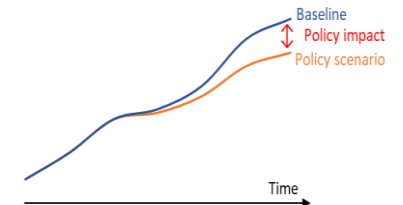
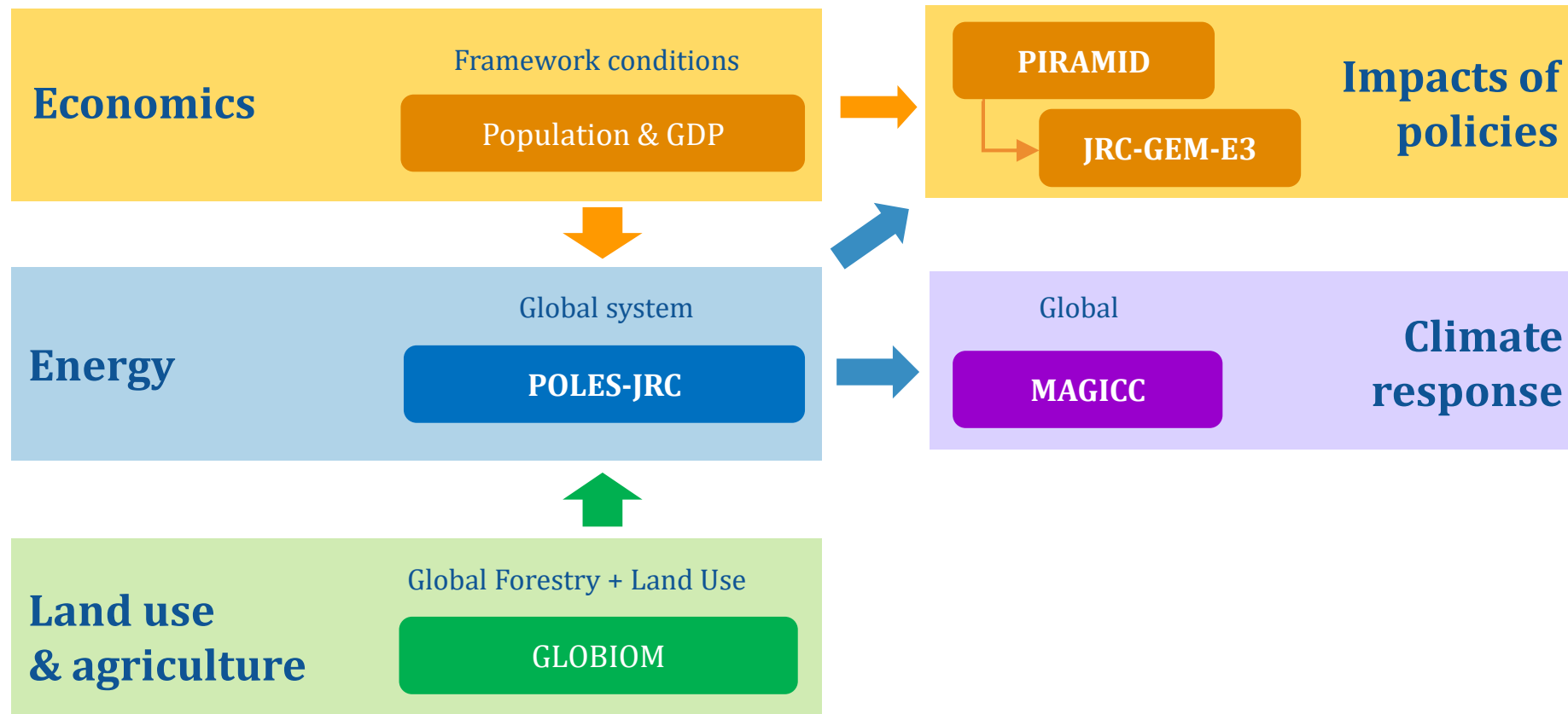
Session #45 - Environmental Policies

Introduction

- COP26: Renewed climate policy commitments
 - Are the Paris Agreement targets within reach?
- Our contribution:
 - Projected change in the global average temperature based on a consistent integrated modelling that captures the energy transition and mitigation options to reach temperature targets
 - Assess the gaps between current and announced policies
 - Extend earlier work (Vandyck et al., 2016)
 - Revised technology cost projections
 - Employment results by region, sector and scenario

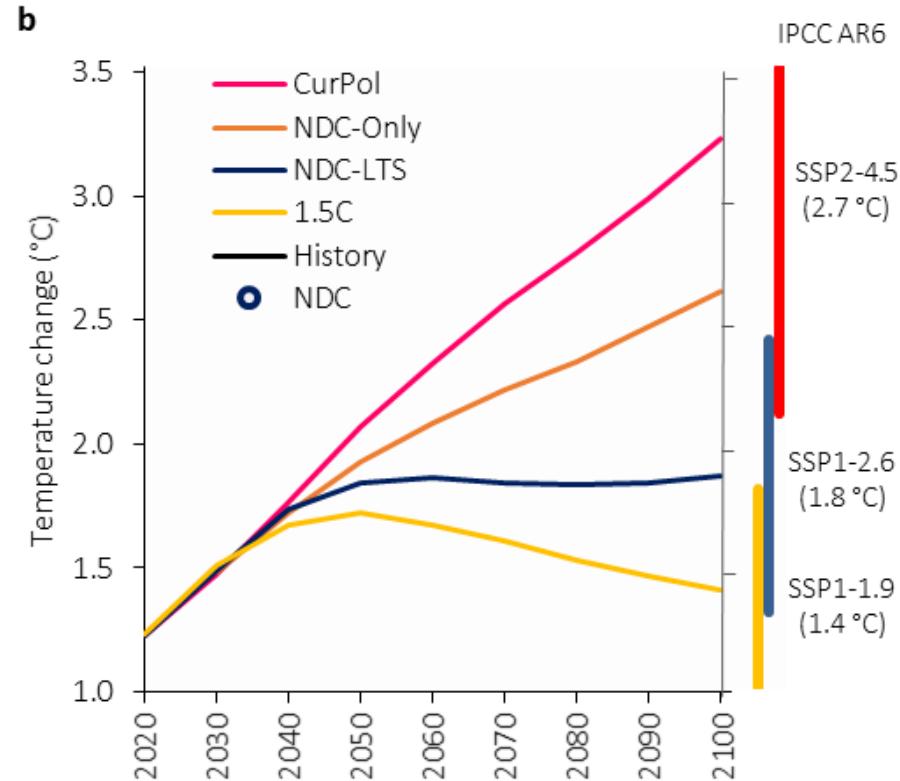
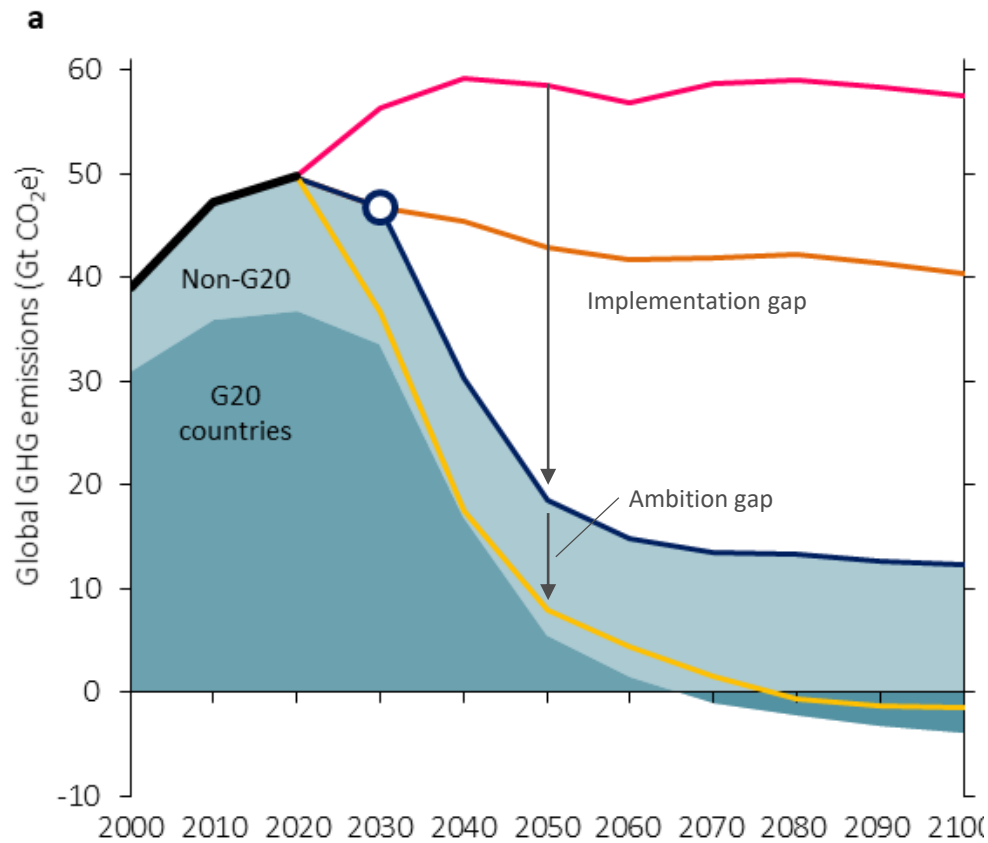


Several models for multidimensional analysis



Which way to go?

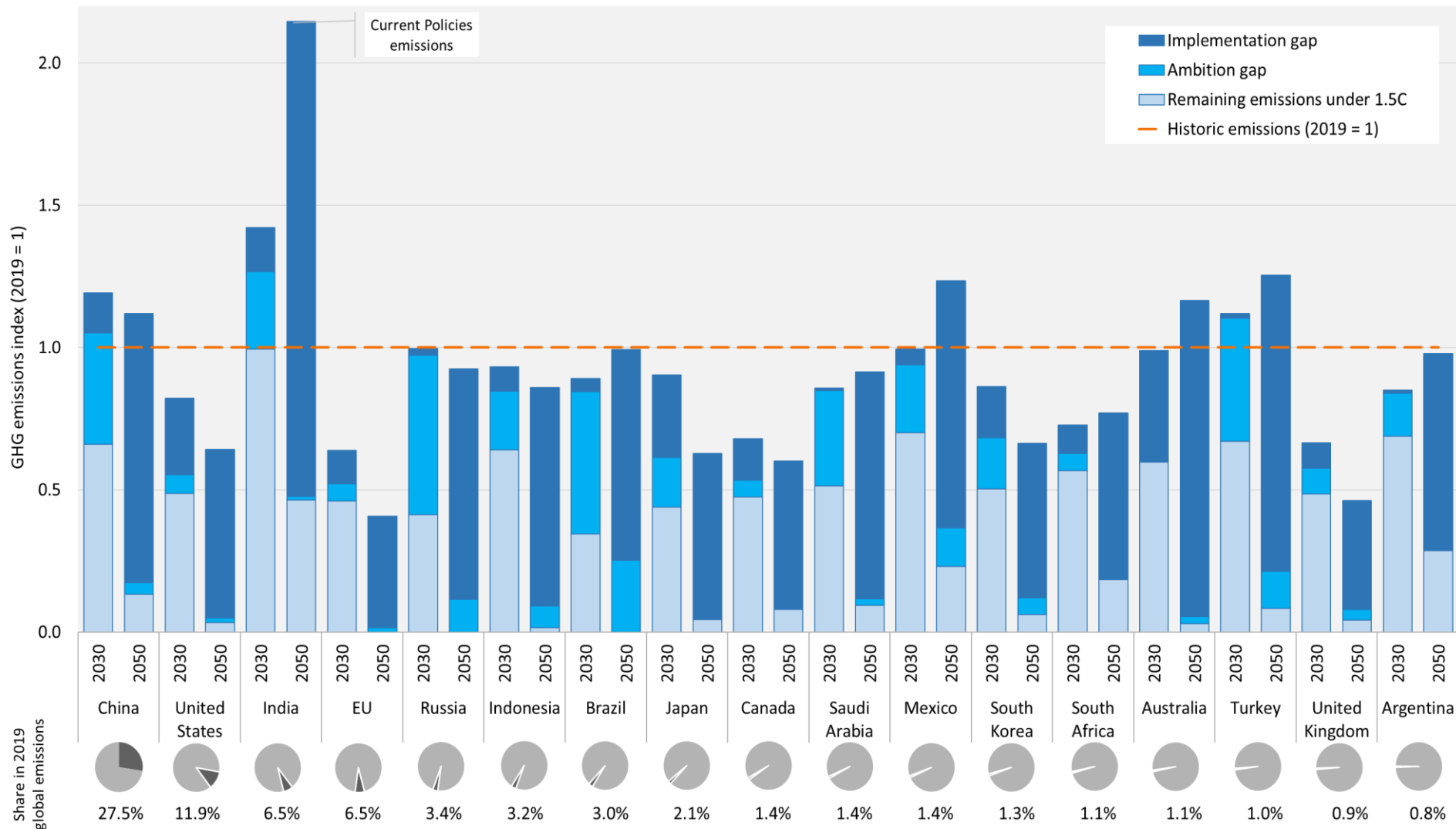
Emissions and temperature change



- Delivering on NDCs and net zero pledges would imply temperature increase of about 1.8°C
- G20 countries contribute the most to bend the curve
- Sizeable implementation gap and persistent ambition gap

Closing the gap

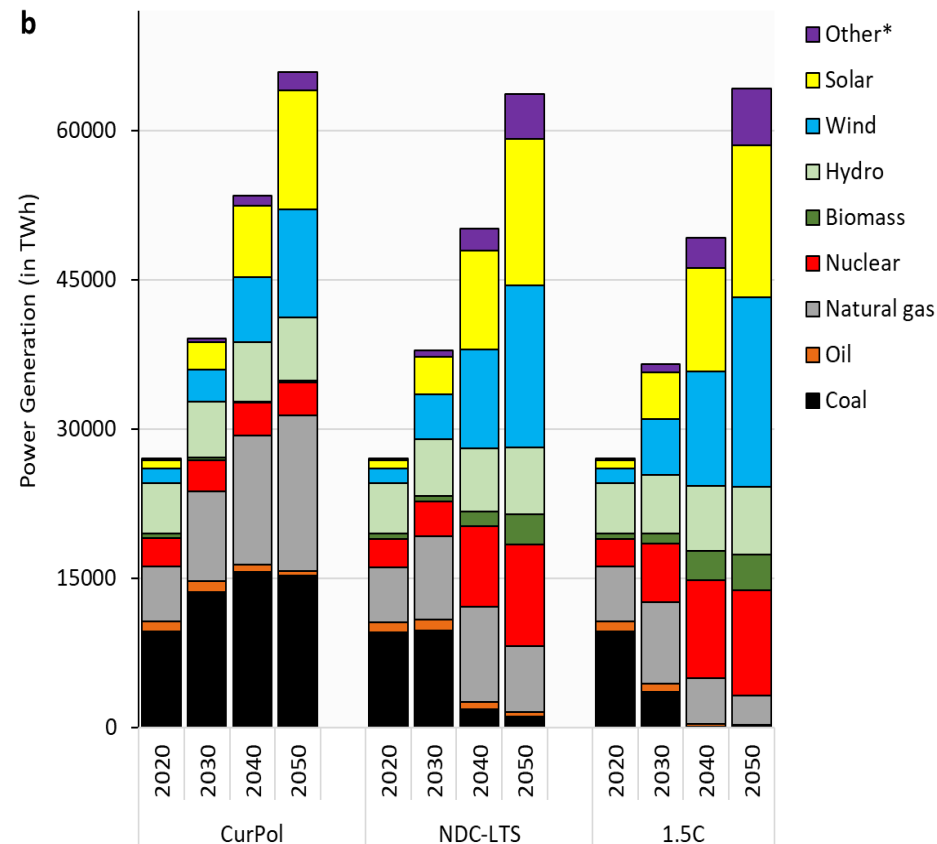
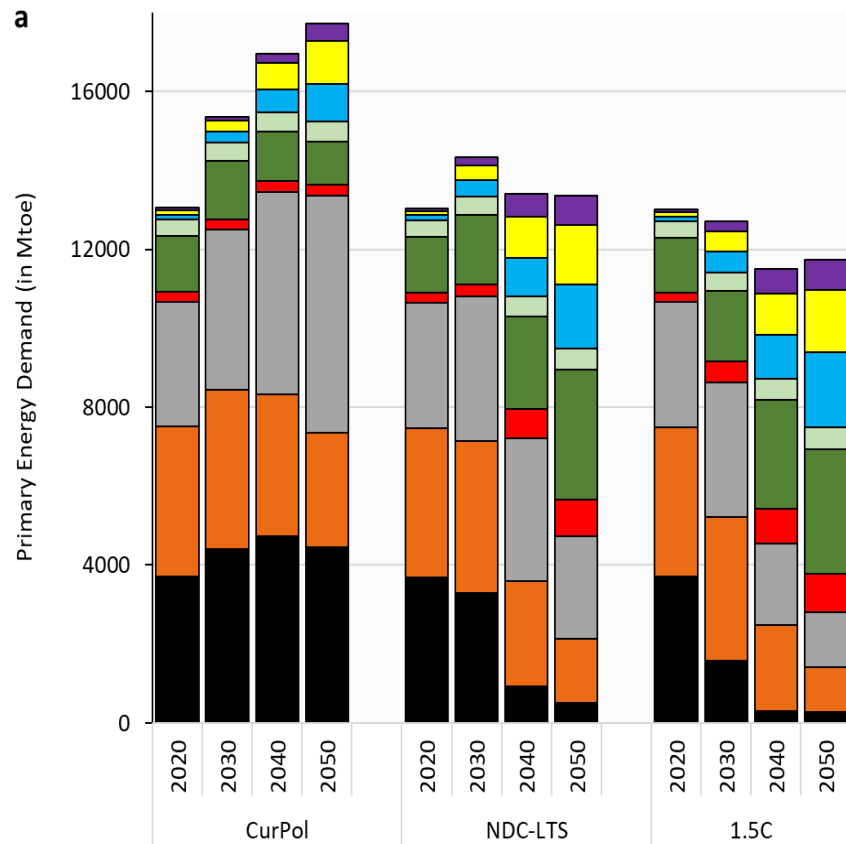
Implementation and ambition in G20 countries



- Need for immediate adoption of policies to achieve the LTS targets
- Announced net-zero targets get the world closer to a 1.5C pathway
- Much lower emissions needed to reach the 1.5C target – i.e., remaining emissions to be abated

Energy transition

Primary energy demand and Power generation

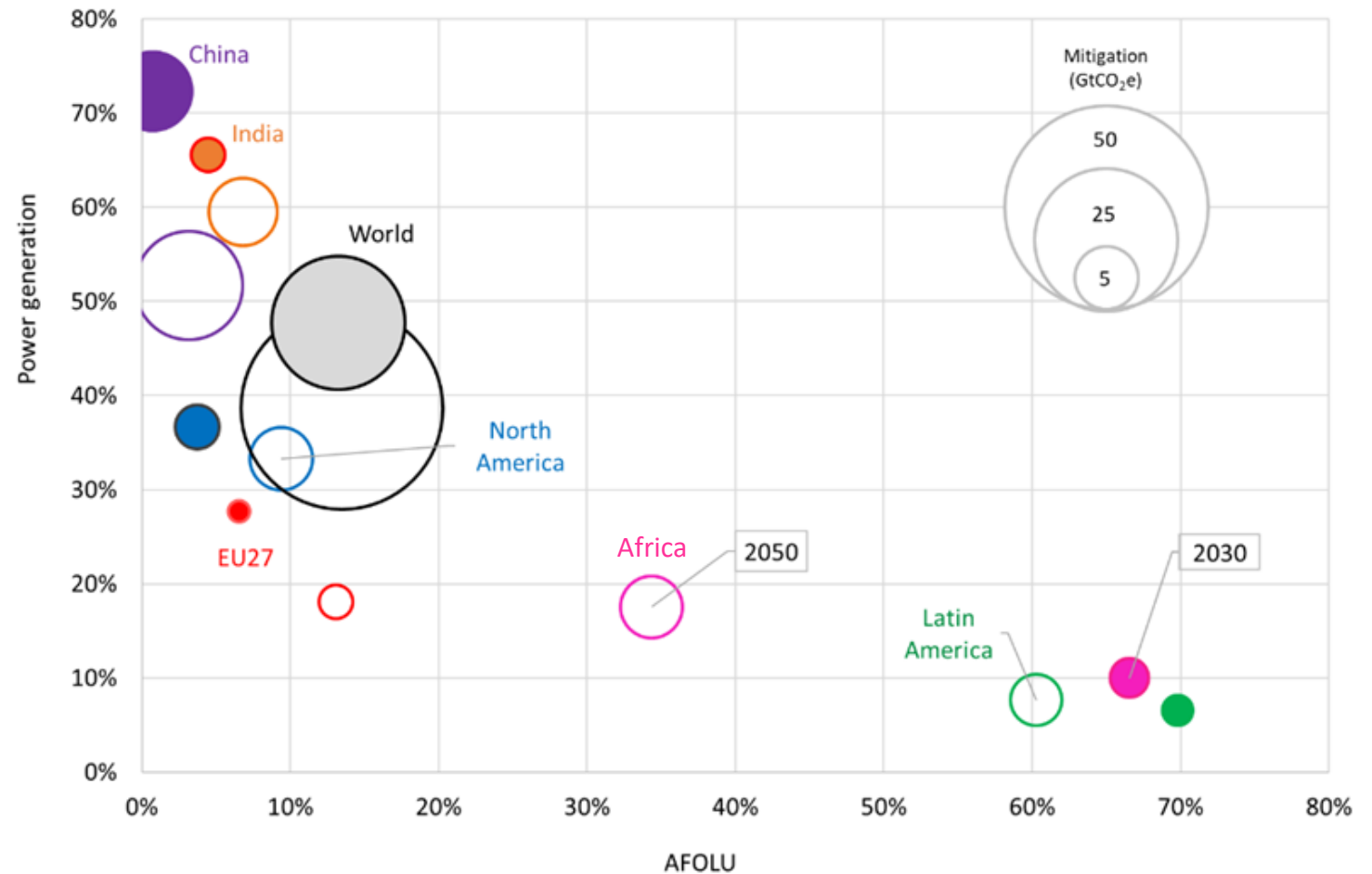


- Reduced energy use with more climate ambition
- Lower fossil energy use, especially coal, and in particular for electricity generation
- Increased use of renewables (mainly wind and solar) and nuclear

Abatement options across regions

AFOLU vs. Power sector

- All sectors and regions need to contribute – role of abatement options can vary across regions
- AFOLU as a key option for some regions, particularly through improved practices in agriculture and deforestation control.
- Global mitigation increases towards mid-century (~ 50 GtCO₂e)



Economics

Sector-specific output and investment in 2040

- Strong decrease in total output of fossil fuel sectors led by the phase out of coal
- Investments into renewables in the power generation promote growth in the construction sector
- Biomass production expands as another source of mitigation in various regions.
- Global costs are less than half a percent of the global GDP by 2040.

Table 1

Sector-specific output, investment and employment levels results in 2040, by scenario. Energy sectors shaded in grey.

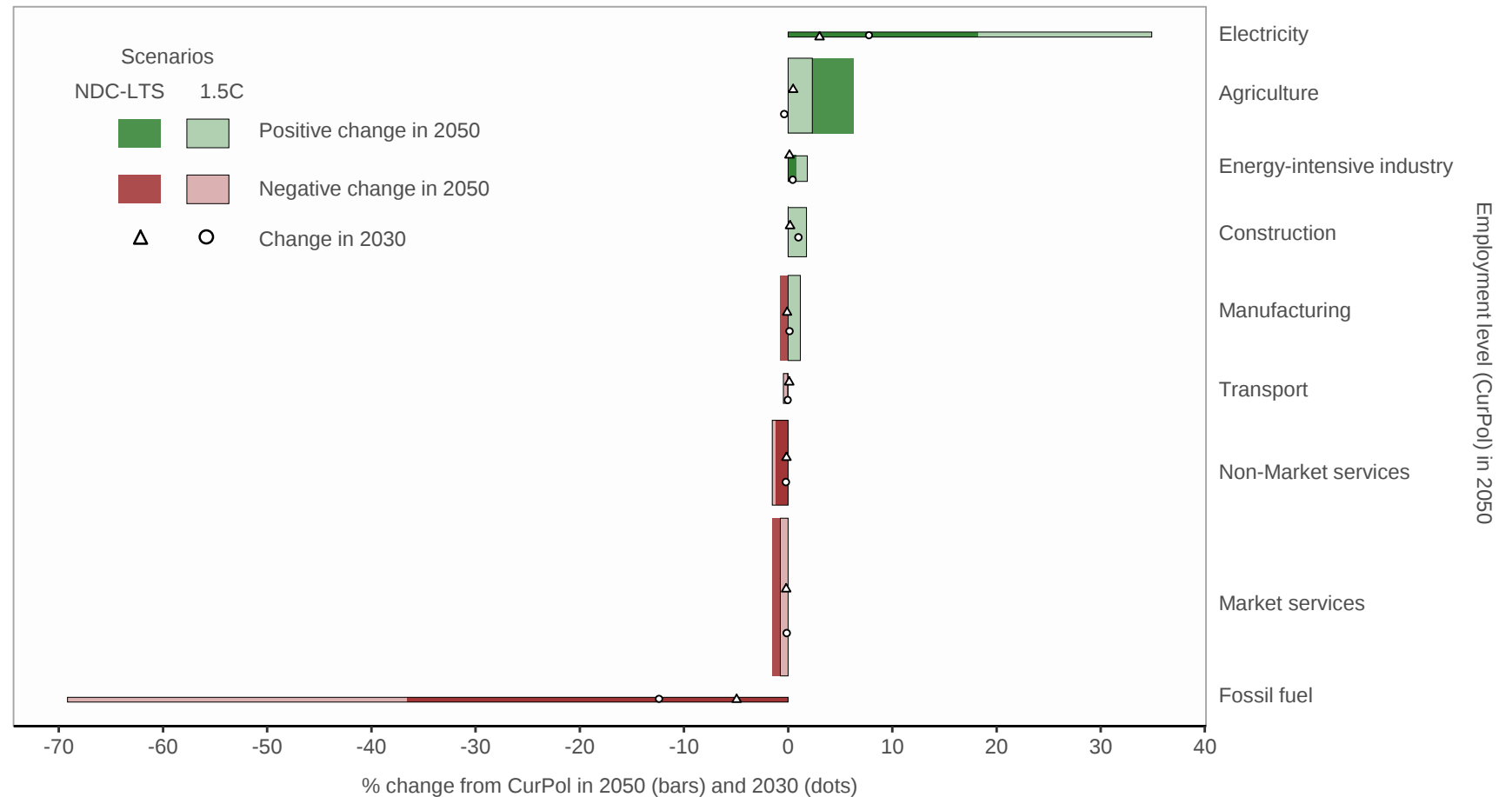
% change from CurPol Scenario:	Output level		Investment	
	NDC-LTS	1.5C	NDC-LTS	1.5C
Global ^a	-0.4	-0.5	1.0	0.8
Agriculture and Forestry	5.2	4.4	5.1	4.6
Livestock	-1.9	-2.7	-0.4	-1.2
Coal	-73.5	-87.8	-76.9	-87.3
Crude Oil	-22.0	-25.7	-19.0	-24.8
Oil Products	-22.2	-26.1	-16.1	-21.4
Gas	-25.4	-46.0	-20.1	-41.5
Electricity	3.9	5.2	84.1	62.1
Ferrous metals	-0.4	-0.1	4.6	10.4
Non-ferrous metals	0.1	-0.5	1.9	3.7
Chemical Products	-0.8	-0.9	1.0	0.8
Non-metallic minerals	-0.1	-1.1	1.5	1.5
Electric Goods	0.6	1.7	0.8	2.8
Consumer Goods Indust.	-0.7	-0.7	0.6	1.3
Construction	1.0	1.1	2.0	2.9
Transport	-1.5	-1.7	2.3	2.3
Market Services	-0.3	-0.1	0.1	0.5

^a Output shows global GDP change from CurPol scenario.

Economics

Transition of jobs by sector

- Global transition of jobs from fossil-fuel sectors to low-carbon oriented sectors
- Bioenergy and electrification lead to increased opportunities in other sectors
- Service-oriented sectors grow but slightly less than projected in CurPol



Conclusions

- Current policies lead to temperature increase of about 3 °C, while delivering on NDCs and net zero pledges brings planet towards Paris targets (1.8 °C)
- Ambition gap to 1.5 °C remains, both in the short and long term
- Strong decarbonisation of the power sector further enables mitigation through greater electrification of energy uses
- Increase in renewable energy jobs offsets job losses in fossil fuel sectors
- Report available at <https://ec.europa.eu/jrc/en/geco> with energy balances, socioeconomic implications, detailed G20 country analysis

Thank you



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