



# Gaps of Climate Governance

*Igor Makarov*

*Head of School of World Economy,*

*Head of Laboratory for Economics of Climate Change,*

*Scientific Supervisor of Master's Programme "Environmental  
Economics and Sustainable Development"*

*HSE University*



# Three gaps

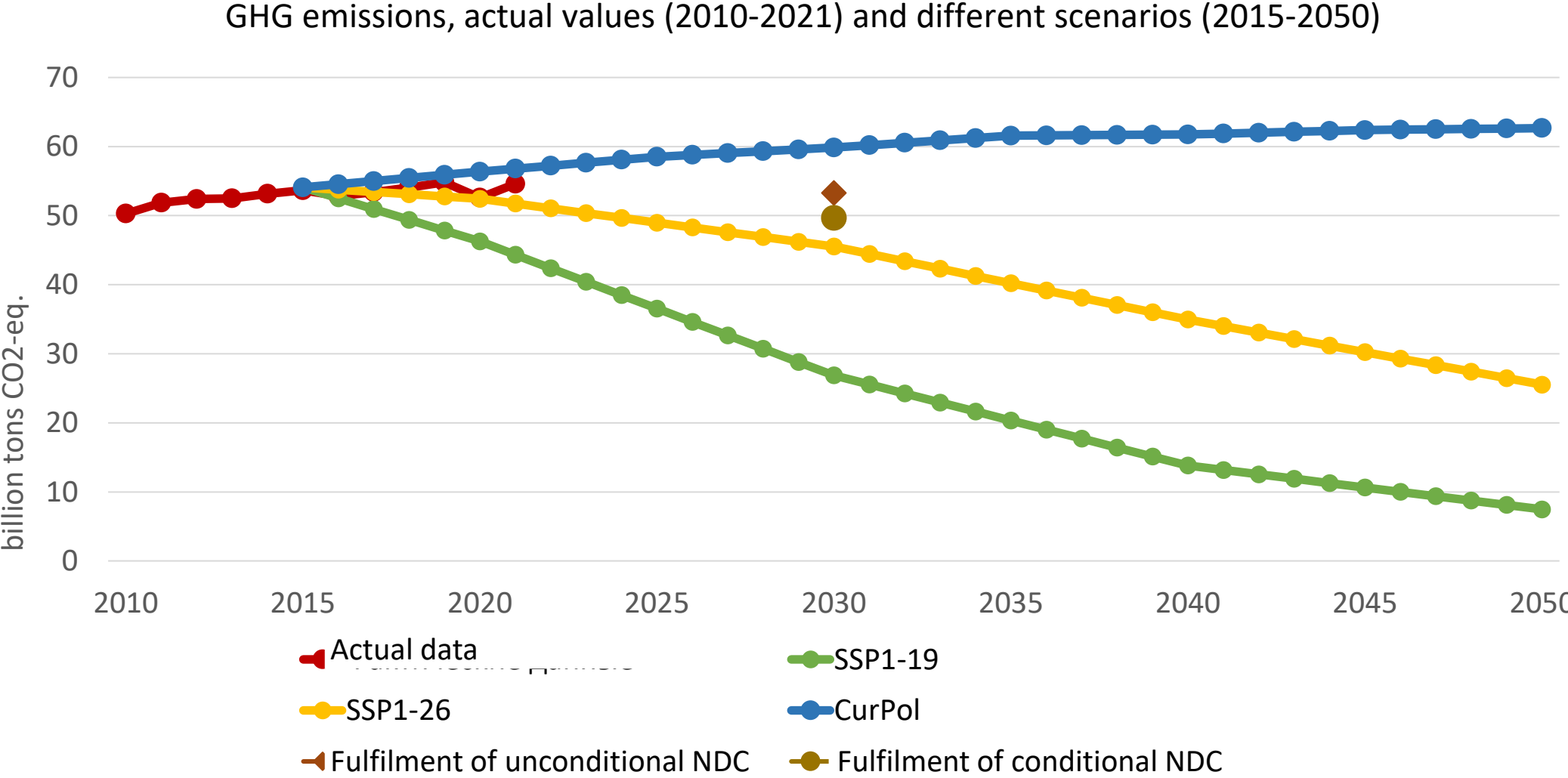
- Mitigation gap
- Climate finance gap
- Coordination gap

# The Paris Agreement: goals

The Paris Agreement's goal: **To keep a global temperature "well below 2°C above pre-industrial levels" and "to pursue efforts to limit the temperature increase even further to 1,5°C"**

		Emissions reduction compared to 2019 levels, %			
		2030	2035	2040	2050
Below 1,5°C (probability >50%)	GHG	43 [34-60]	60 [49-77]	69 [58-90]	84 [73-98]
	CO <sub>2</sub>	48 [36-69]	65 [50-96]	80 [61-109]	99 [79-119]
Below 2°C (probability >67%)	GHG	21 [1-42]	35 [22-55]	46 [34-63]	64 [53-77]
	CO <sub>2</sub>	22 [1-44]	37 [21-59]	51 [36-70]	73 [55-90]

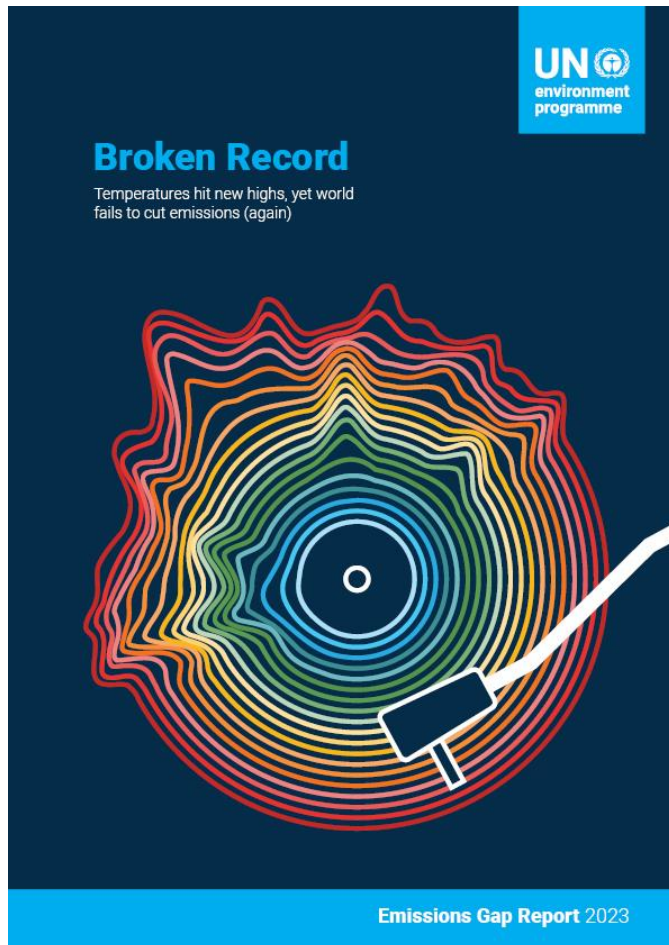
# Temperature targets are gradually becoming unattainable



Source: Calculated by Laboratory for Economics of Climate Change of HSE University based on IPCC data, Jones et al. 2023, EDGAR

# Temperature targets are gradually becoming unattainable

Expected emissions and emissions gaps in different scenarios

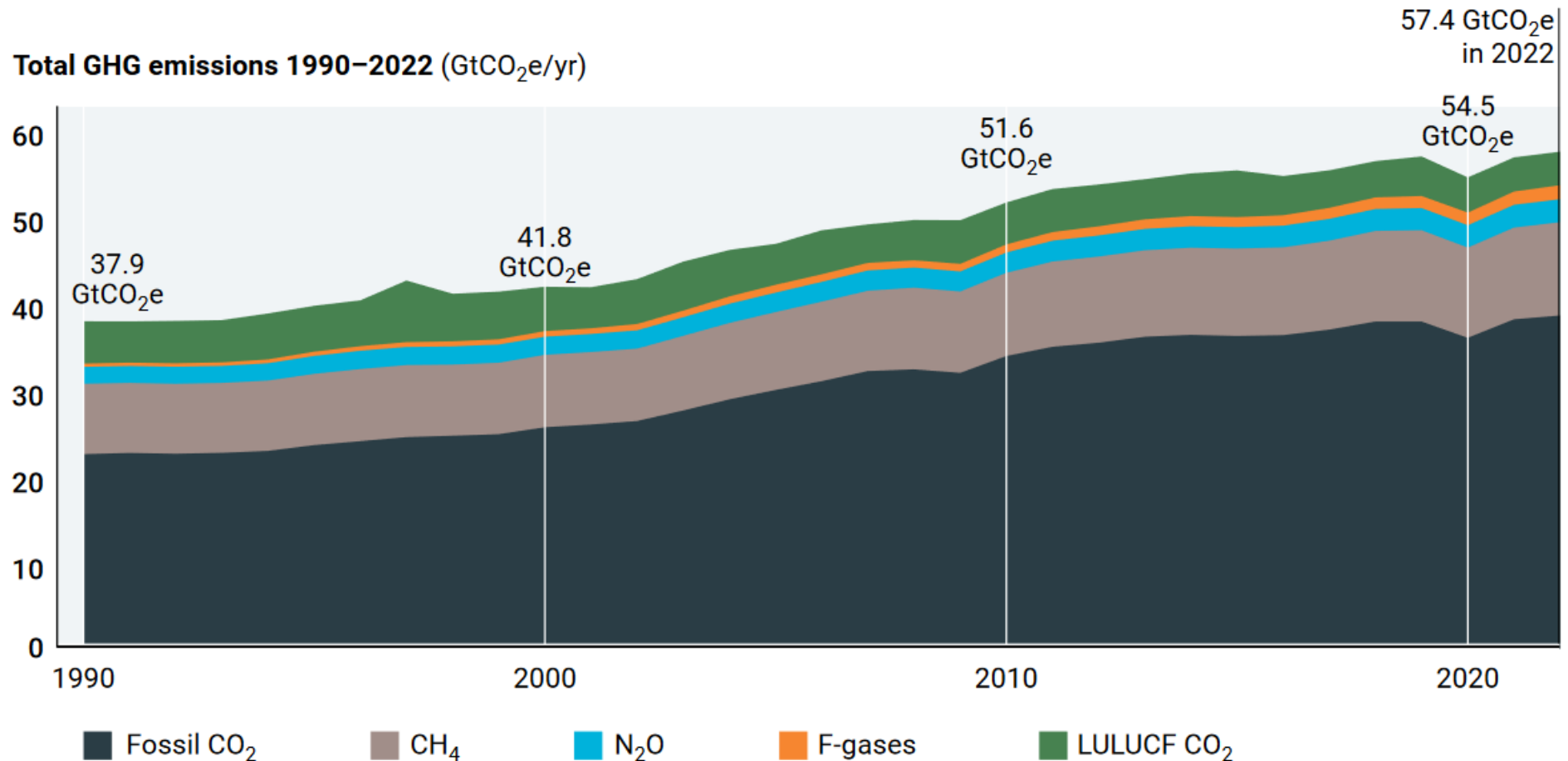


	Emissions in 2030 r. (billion tons CO <sub>2</sub> -eq.) Median and range	Expected emissions gap by 2030 (billion tons CO <sub>2</sub> -eq.)		
		Below 2°C	Below 1,8°C	Below 1,5°C
2010 Policy	64 [66-68]			
Current policy	56 [52-60]	16 [11-19]	22 [17-25]	24 [19-27]
Unconditional NDCs	55 [54-57]	14 [13-16]	20 [19-22]	22 [21-24]
Conditional NDCs	52 [50-55]	11 [9-15]	17 [15-20]	19 [17-23]

Source: UNEP, 2022, 2023

# Global GHG emissions in 2022 have broken records

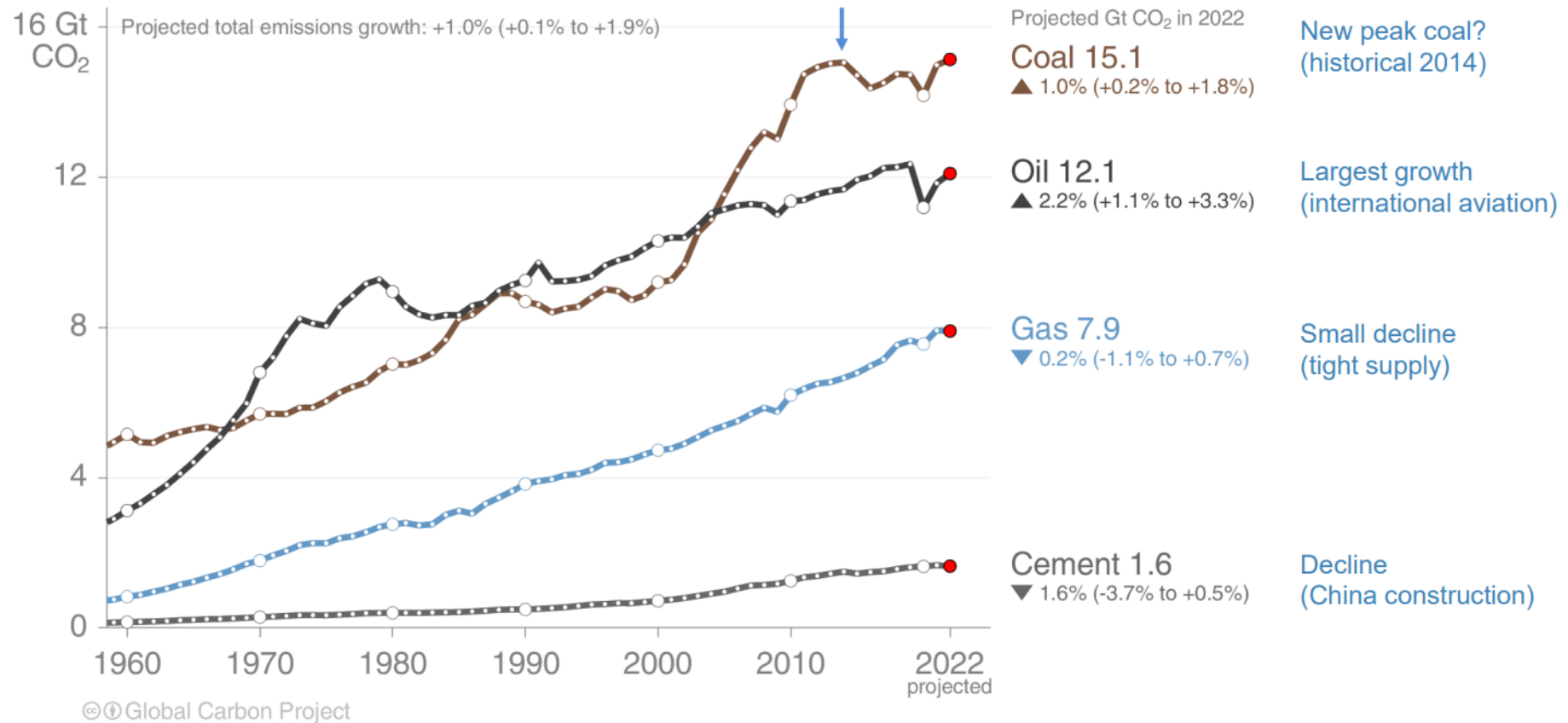
Total net anthropogenic CO<sub>2</sub> emissions in 1990-2022



Source: UNEP, 2023

# Consumption of coal and natural gas is above the pre-COVID values

Global emissions of CO<sub>2</sub> from fossil fuel combustion and cement production



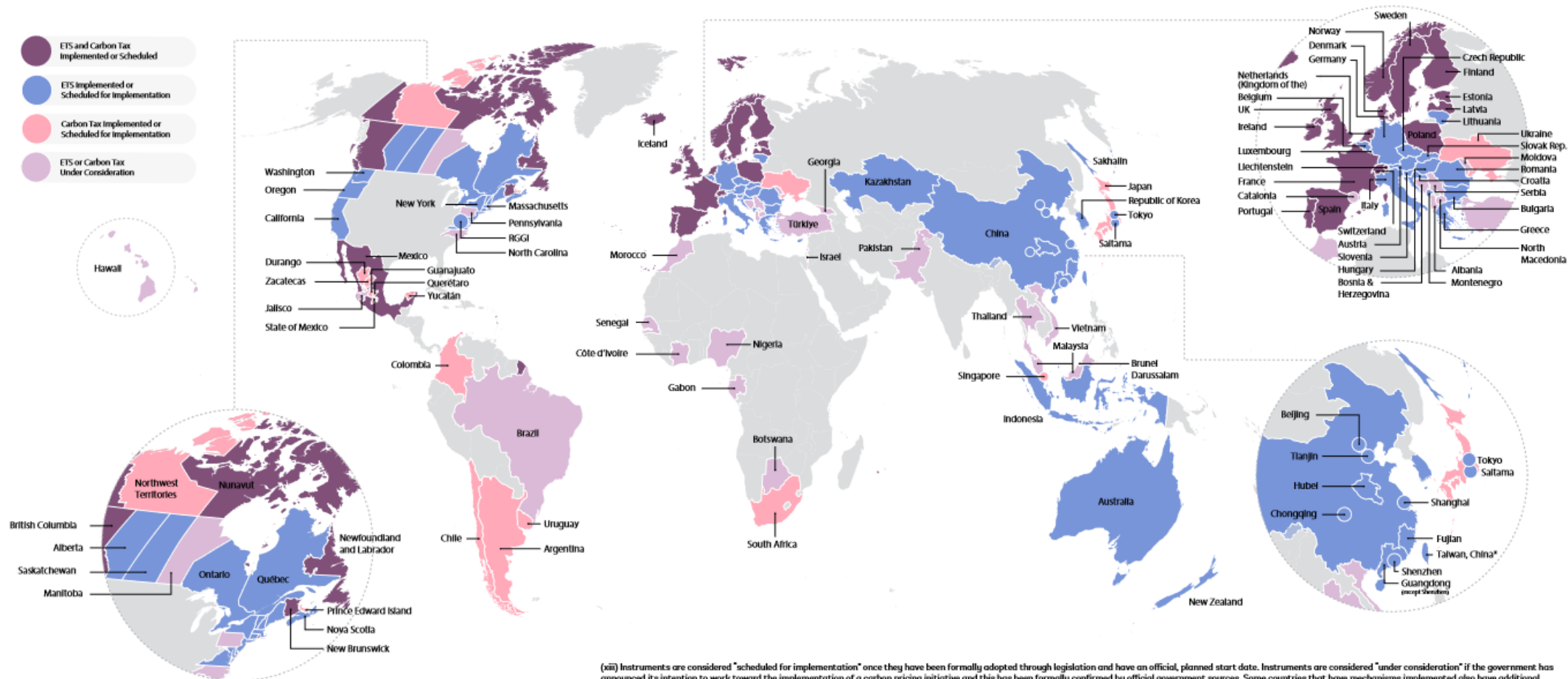
# Decarbonization in the world

- ✓ More than 130 countries, 800 cities, 100 regions and 700+ companies have announced goals to achieve carbon neutrality by the middle of the century
- ✓ European Green Deal, Inflation Reduction Act in US (\$386 bn to green technologies), full-scale RE development in China etc.
- ✓ Carbon price introduced in 73 countries and regions of the world, about 23% of global greenhouse gas emissions, the turnover of carbon markets – \$95 billion
- ✓ Introduction of Carbon Border Adjustment Mechanism (CBAM) in the EU
- ✓ Development of new technologies: renewables, electric vehicles, hydrogen economy
- ✓ development of the green bond market: in 2022 they were issued for almost \$443 bn
- ✓ spread of ESG standards among business
- ✓ dissemination of TCFD standards and widespread climate stress testing



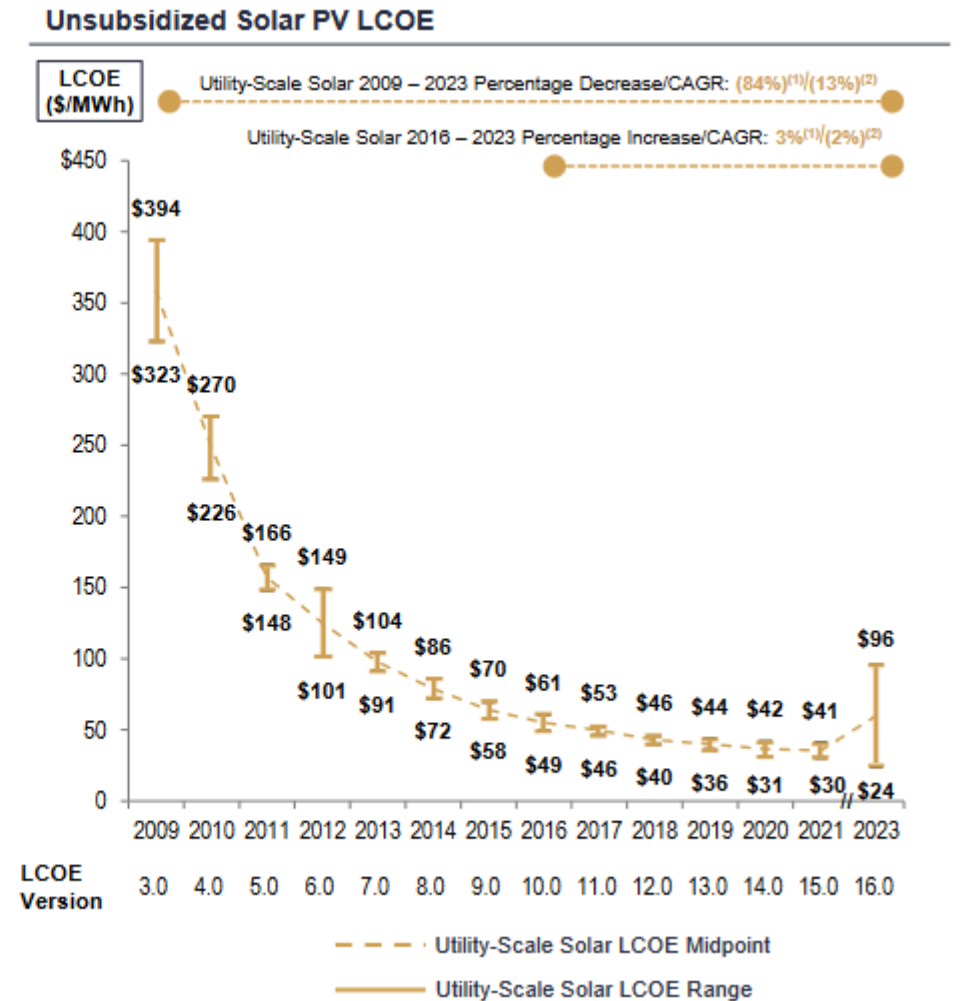
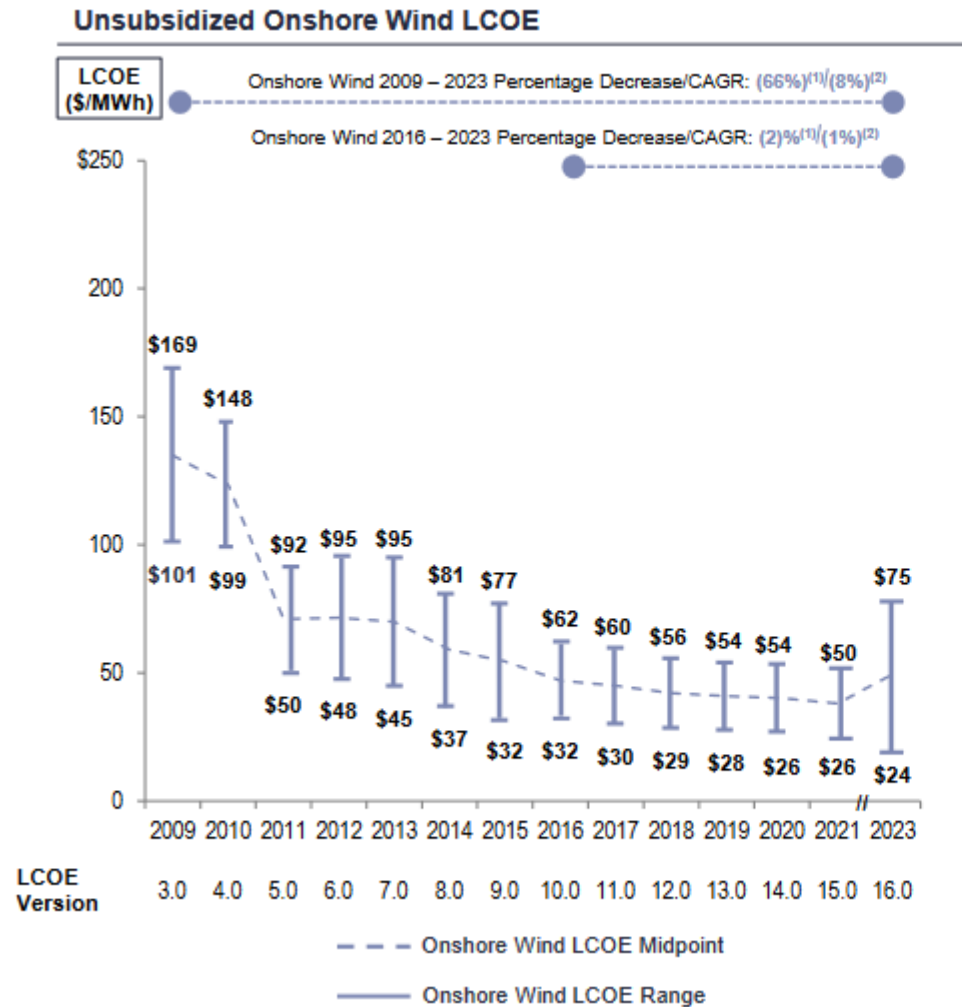
# Carbon pricing in the world

FIGURE 5  
MAP OF CARBON TAXES AND ETSs<sup>(xii)</sup>



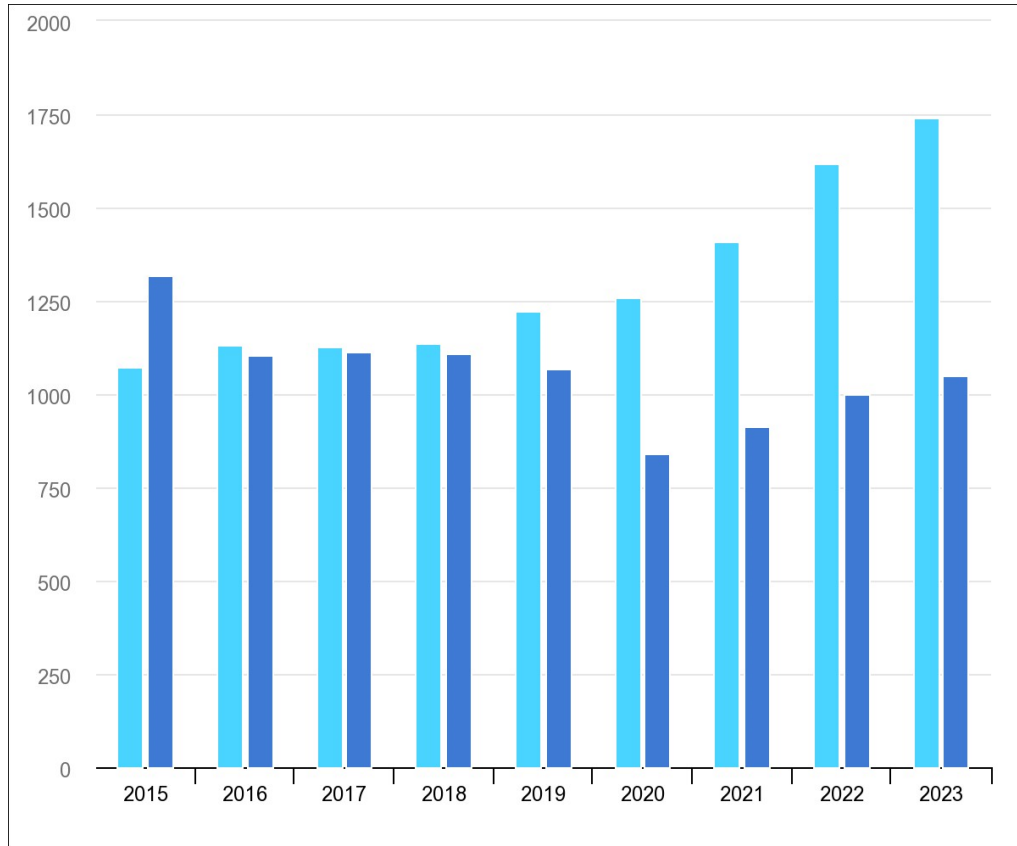
(xii) Instruments are considered "scheduled for implementation" once they have been formally adopted through legislation and have an official, planned start date. Instruments are considered "under consideration" if the government has announced its intention to work toward the implementation of a carbon pricing initiative and this has been formally confirmed by official government sources. Some countries that have mechanisms implemented also have additional instruments under consideration. For subnational jurisdictions only the subnational instrument is reflected.

# Costs of renewable energy increased a little bit in 2023 but still lower than the cost of fossil fuels

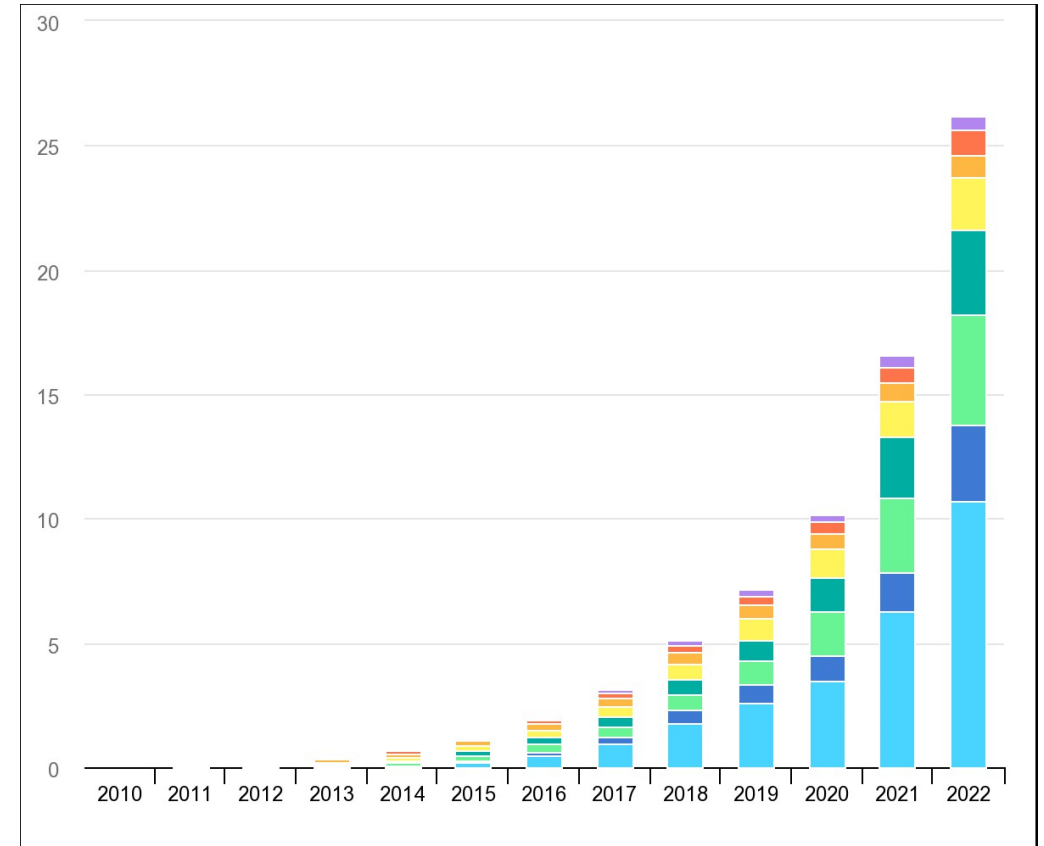


# Investment in renewable and conventional energy

Investment in renewable energy and fossil fuel, 2015-2023, billion dollars



Number of electric cars in the world, 2010-2022, millions



- Clean energy
- Fossil fuels
- China BEV
- China PHEV
- Europe BEV
- Europe PHEV
- United States BEV
- United States PHEV
- Other BEV
- Other PHEV

Source: IEA, 2023

## Mitigation gap: summary

---

- The pace of the green transformation of the world in 2022-2023 has accelerated
  - The race for green competition between the leading countries has accelerated
  - At the same time, the gap between the current climate policy measures and the required ones has grown!
  - **The current pace of green transformation of the world economy is enough to fully transform it, but not enough to meet the temperature goals of the Paris Agreement**
  - GST will demonstrate this clearly
-

## Finance gap

---

- the total amount of climate finance today is \$ 600 billion per year, of which less than 10% is for adaptation
  - \$100 billion promised by developed countries has not yet been accumulated (there are \$83 billion)
  - the need for adaptation finance- \$160-340 billion by 2030 and \$315-565 billion by 2050 (UNEP)
  - the need for mitigation finance – \$3-6 trillion per year by 2050 (IMF)
  - the main question is how to mobilize private capital?
-

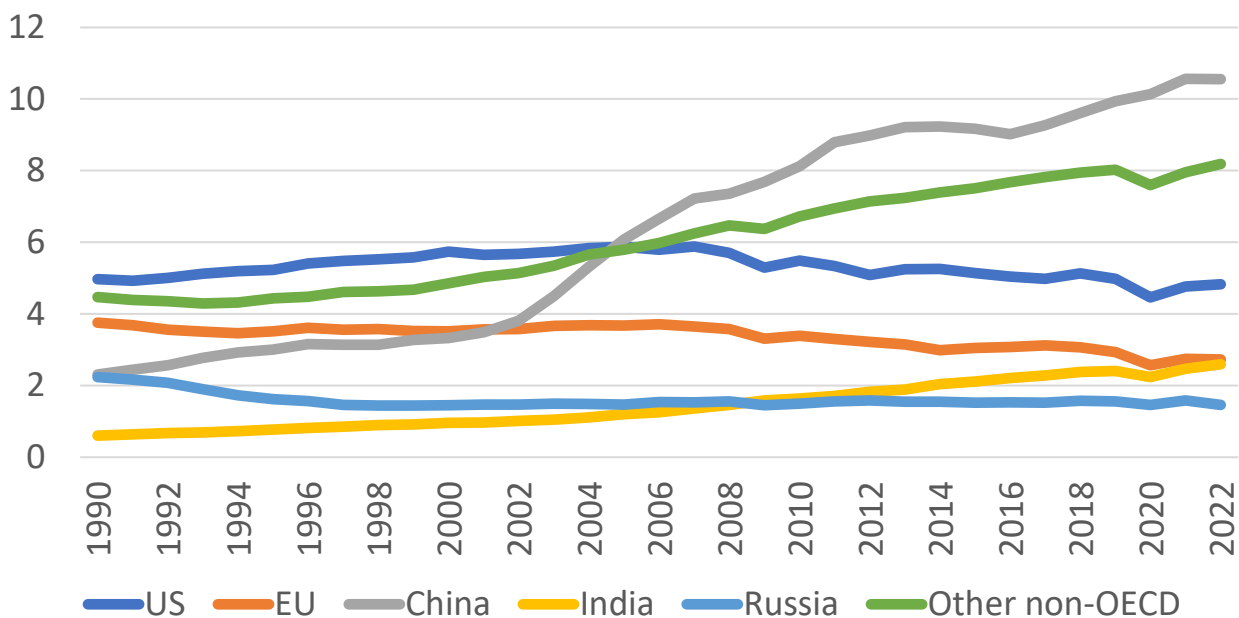
## Some important initiatives

---

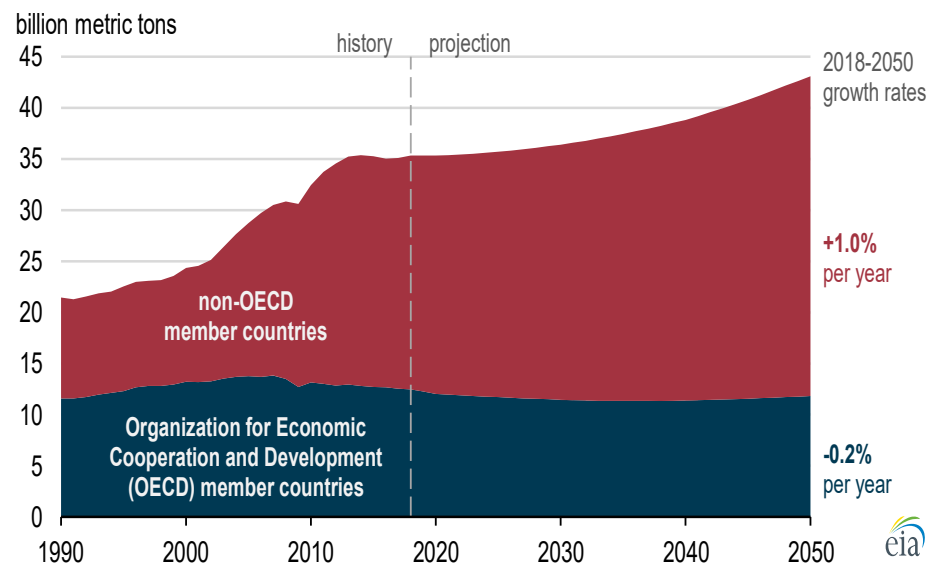
- Just energy transition partnership (JETP):
    - 2021: France, Germany, UK, EU, USA – South Africa (\$8,5 billion)
    - 2022: G7 countries and Norway – Indonesia (\$20 billion)
    - 2022: UK, USA, Japan and EU – Vietnam (\$15,5 billion)
  - Global Climate Alliance (G20, initiator – India)
  - Global Goal on Adaptation (within COP)
  - Reform of MDBs (Independent G20 expert group on strengthening NDBs – L. Summers, N.K. Singh)
-

# Coordination gap: Developed countries are investing in green technologies while emissions are rising in developing countries

CO<sub>2</sub> emissions from fossil fuels combustion in 1990-2022, Gt



Global CO<sub>2</sub> emissions from fossil fuel combustion by 2050



Source: BP, EIA

# Who should pay: producers or consumers?

Emissions from production and consumption in OECD and BRICS countries in 2020

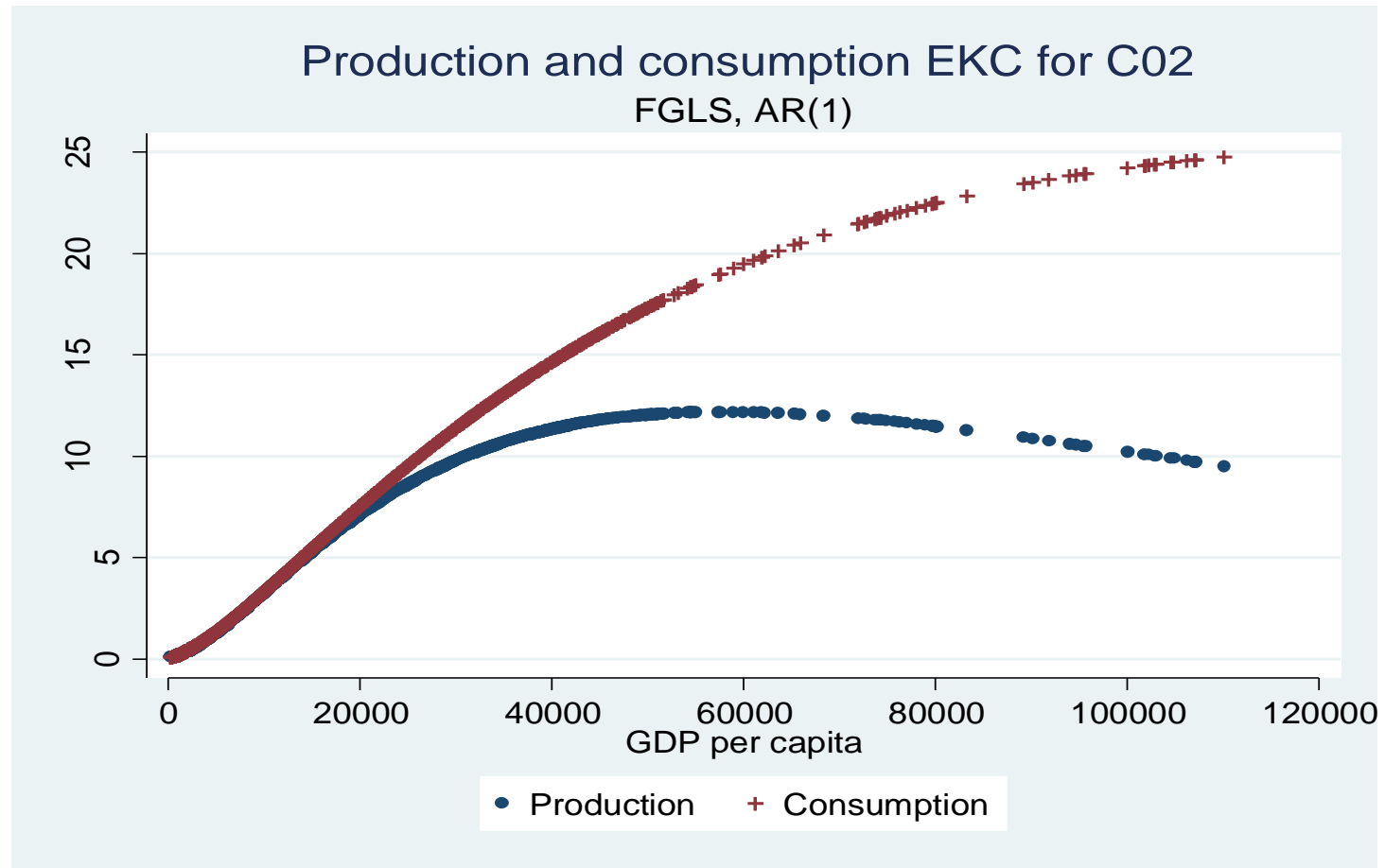
OECD countries	Emissions from production	Emissions from consumption	Net emissions exports	Share of emissions net exports in emissions from production	BRICS countries	Emissions from production	Emissions from consumption	Net emissions exports	Share of emissions net exports in emissions from production
USA	4 715.6	5 197.4	-481.8	-10.2%	China	10 956.1	10 033.5	922.6	8.4%
Japan	1 042.4	1 187.1	-144.7	-13.9%	India	2 445.0	2 276.8	168.2	6.9%
Germany	639.4	769.4	-130.1	-20.3%	Russia	1624.3	1360.1	264.2	16.3%
Republic of Korea	597.6	659.5	-61.9	-10.4%	Brazil	442.2	425.8	16.5	3.7%
Canada	534.9	490.6	44.3	8.3%	South Africa	436.0	302.3	133.7	30.7%
Turkey	413.3	402.3	11.0	2.7%					
Mexico	391.7	432.4	-40.7	-10.4%					
Australia	400.1	354.7	45.4	11.4%					
UK	326.5	464.6	-138.1	-42.3%					
Italy	302.3	388.8	-86.5	-28.6%					
Poland	303.4	287.3	16.1	5.3%					
France	279.9	375.2	-95.3	-34.0%					
Spain	213.2	253.5	-40.3	-18.9%					
Netherlands	137.8	152.1	-14.3	-10.4%					
Czech Republic	92.0	100.0	-8.1	-8.8%					
Other OECD countries	748.2	1 188.6	-440.4	-58.9%					
<b>OECD - total</b>	<b>11 138.2</b>	<b>12 702.7</b>	<b>-1 564.5</b>	<b>-14.0%</b>	<b>BRICS - total</b>	<b>16862.5</b>	<b>14398.8</b>	<b>2463.7</b>	<b>14.6%</b>

Source: based on GCP data



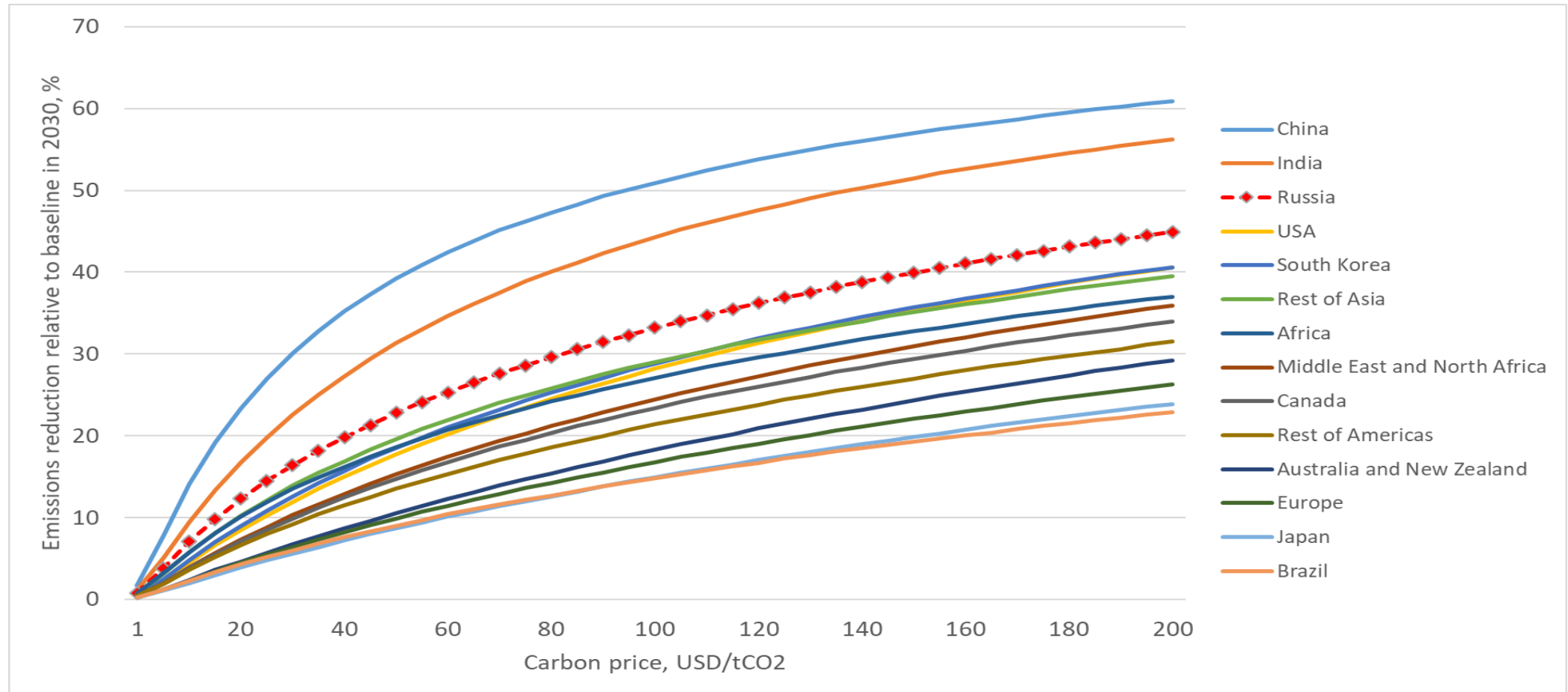
# EKC for production- and consumption-based CO<sub>2</sub> emissions

Peak of production EKC: \$57,919; Peak of consumption EKC: \$140,672



# Where should emissions be reduced: where there is a willingness to do so, or where it is the cheapest?

Marginal abatement cost curves for reducing GHG emissions by regions





**Thank you for your attention!**

