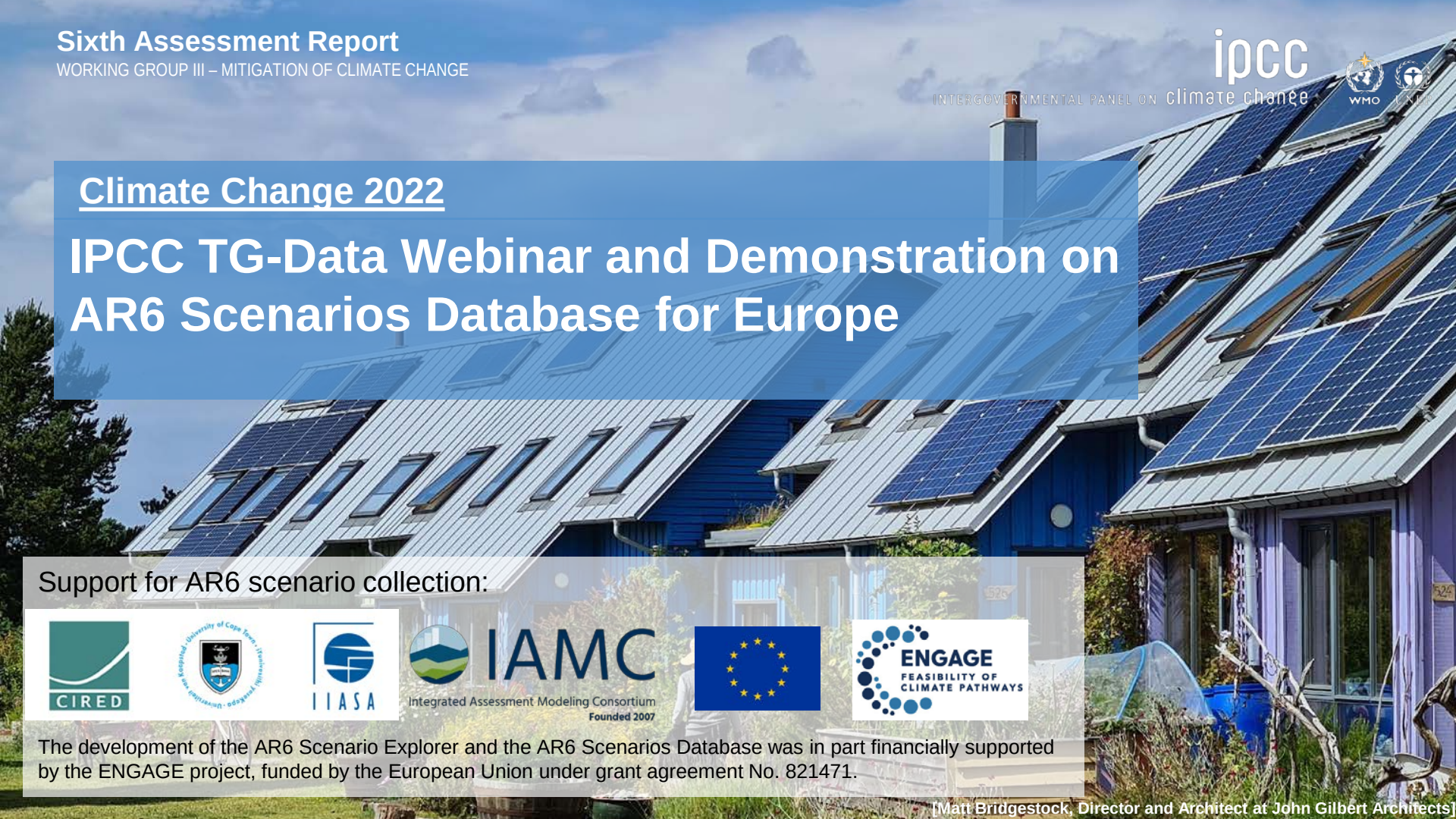


Sixth Assessment Report
WORKING GROUP III – MITIGATION OF CLIMATE CHANGE

ipcc
INTERGOVERNMENTAL PANEL ON climate change

Climate Change 2022

IPCC TG-Data Webinar and Demonstration on AR6 Scenarios Database for Europe

Support for AR6 scenario collection:

CIRED · University of Cape Town · IIASA · IAMC Integrated Assessment Modeling Consortium Founded 2007 · ENGAGE FEASIBILITY OF CLIMATE PATHWAYS

The development of the AR6 Scenario Explorer and the AR6 Scenarios Database was in part financially supported by the ENGAGE project, funded by the European Union under grant agreement No. 821471.

[Matt Bridgestock, Director and Architect at John Gilbert Architects]

Agenda

- Volker Krey (IIASA), Franck Lecocq (CIRED): Welcome and housekeeping (5 mins)
  - Franck Lecocq: Models and scenarios in IPCC AR6 – A quick overview (7 mins)
  - Volker Krey: Use of national and regional pathways in AR6 (7 mins)
  - Questions & Answers (5 mins)
- David Huard (TG-Data), Alaa Al Khourdajie (WGIII TSU), Adam Milward (MetadataWorks): Introduction to TG-Data, FAIR principles general guidelines, DDC overview. [Pre-recorded video] (15 mins)
  - Questions & Answers (5 mins)
- Edward Byers (IIASA): Introduction to AR6 Scenario Explorer [Pre-recorded video] (5 mins)
- Edward Byers (IIASA): Demonstration on Scenario Explorer Part I and II with Questions & Answers in between (~40 mins)
- Additional Questions & Answers (30 mins)

Forthcoming regional events in this series

Date	Region	Authors	Host Institutions
26.01	Europe	Volker Krey, Franck Lecocq, Ed Byers	IIASA & CIRED
13.02 15.02	Oceania	Andy Reisinger Malte Meinshausen	Ministry of Environment, New Zealand University of Melbourne, Australia
TBC	Africa	Chukwumerije Okereke	Alex Ekwueme Federal University, Nigeria
TBC	Asia	Joyashree Roy	Asian Institute of Technology
TBC	Latin America	Roberto Schaeffer	Fed. Univ. Rio de Janeiro, Brazil
TBC	North America	TBC	TBC

Climate Change 2022

Use of national and regional pathways in AR6

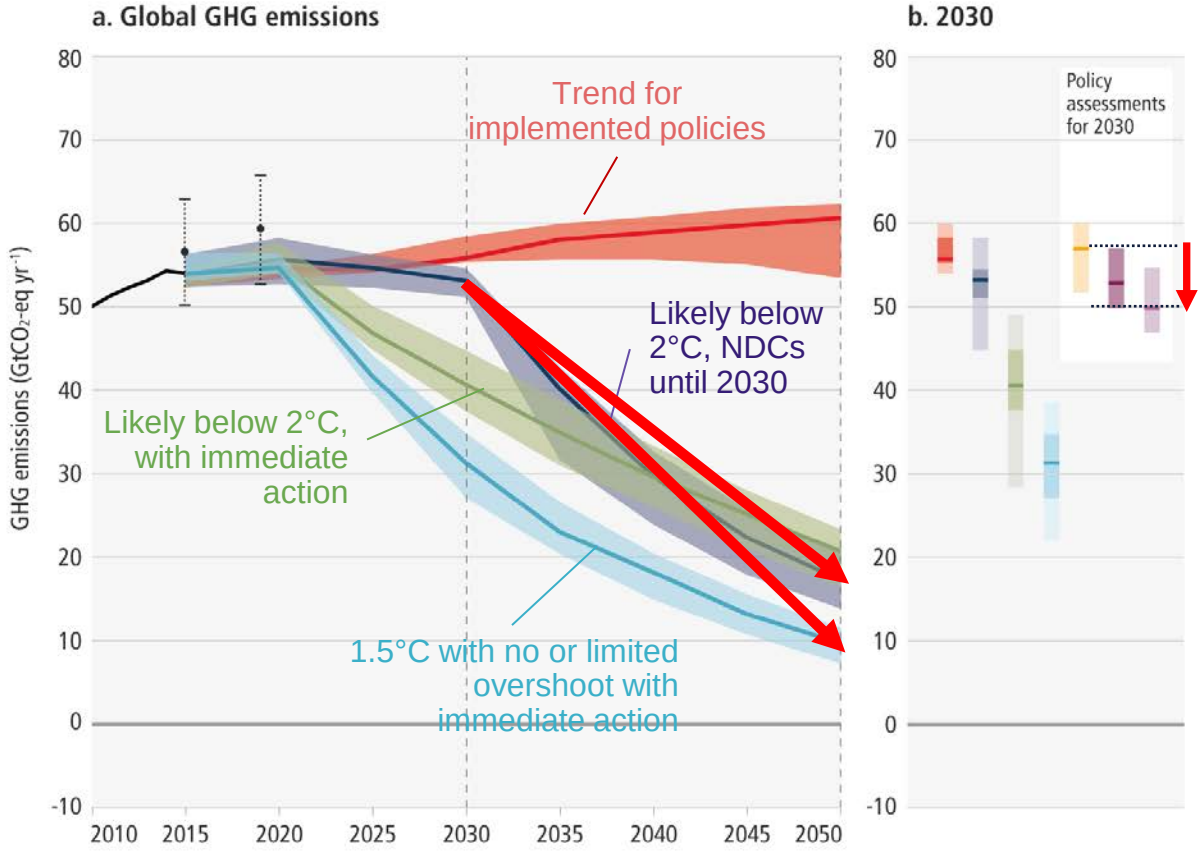
Volker Krey (IIASA)
Lead Author, Chapter 4

Support for AR6 scenario collection:

The development of the AR6 Scenario Explorer and the AR6 Scenarios Database was in part financially supported by the ENGAGE project, funded by the European Union under grant agreement No. 821471.

[Matt Bridgestock, Director and Architect at John Gilbert Architects]

Global GHG emissions of pathways and emission outcomes from 2030 policy assessment



- 1.5°C likely to be exceeded under ambition of current NDC pledges
- Reaching 2°C becomes challenging under current NDC pledges, in particular for future generations
- Implementation gap: 4-7 $GtCO_2eq$

Figure SPM.4

Projected global emissions in 2030 associated with policies implemented by the end of 2020 and NDCs announced prior to COP26, and associated emission gaps.

	Implied by policies implemented by the end of 2020 ($GtCO_2$-eq yr^{-1})	Implied by NDCs announced prior to COP26	
		Unconditional elements ($GtCO_2$-eq yr^{-1})	Including conditional elements ($GtCO_2$-eq yr^{-1})
Median projected global emissions (min–max)*	57 [52–60]	53 [50–57]	50 [47–55]
Implementation gap between implemented policies and NDCs (median)		4	7
Emissions gap between NDCs and pathways that limit warming to 2°C (>67%) with immediate action		10–16	6–14
Emissions gap between NDCs and pathways that limit warming to 1.5°C (>50%) with no or limited overshoot with immediate action		19–26	16–23

Table SPM.1

National/regional near-term GHG emissions assessment

Table 4.3 Projected global GHG emissions of new and updated NDCs by 2030.

Study	Cut-off date	Kyoto GHGs[a] [$GtCO_2$-eq]				References
		Historical		Median (min–max)[b] 2030		
		2015	2019	Unconditional NDCs	Conditional NDCs	
Climate Action Tracker[c]	5/2021	51	52	50	47	Climate Action Tracker (2021)
PBL[d]	9/2021	52	54	53 (51–55)	52 (49–53)	den Elzen et al. (2021); Nascimento et al. (2021)
JRC – GECO[e]	10/2021	51			48	JRC (2021)
Meinshausen et al.[f]	10/2021	54	56	55 (54–57)	53 (52–55)	Meinshausen et al. (2021)
Total[g]				53 (50–57)	50 (47–55)	
Other studies for comparison						
UNEP EGR[h]	9/2021			53 (50–55)	50 (47–53)	UNEP (2017a)
UNFCCC Secretariat[i]	7/2021			57 (55–58)	54 (52–56)	UNFCCC (2021)
ENGAGE[j]	3/2021				51 (49–53)	Riahi et al. (2021)

Most up-to-date studies on NDCs compatible with IPCC literature cut-off (11 October 2021), but based on much more comprehensive review of studies on original NDCs from 2015/16 (see Table 4.1).

Table 4.1 Assessment of projected 2030 emissions of current policies based on pre-COVID assumptions and original NDCs submitted in 2015/16 for 28 individual countries/regions and the world.

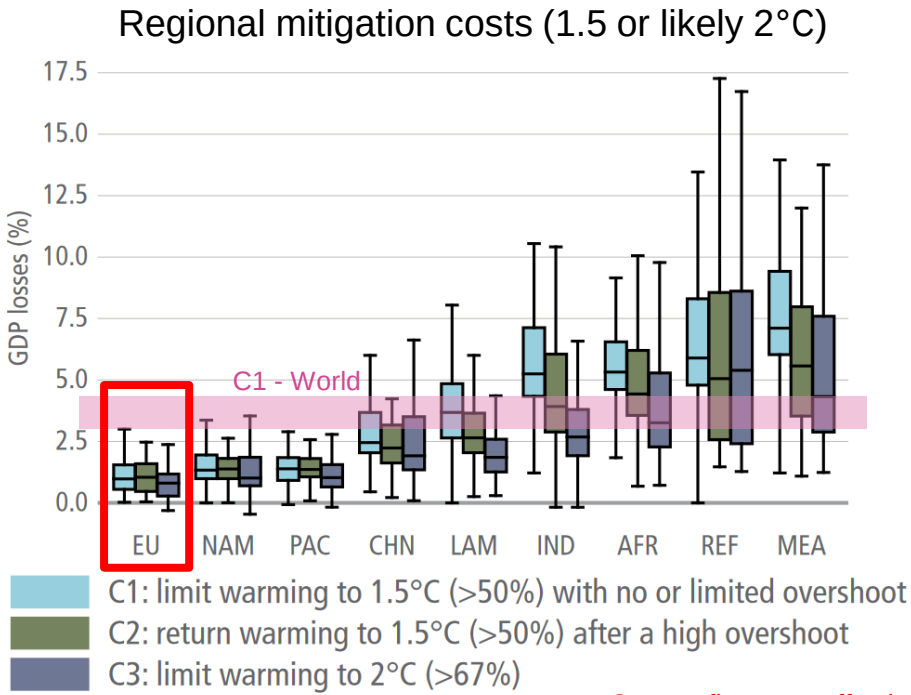
Region[a]	GHG share [%][b]	Type[c]	# estimates[d]	Current Policies 2030 emissions			NDC 2030 emissions (conditional/unconditional)		
				CO_2 only [$GtCO_2$] median (min–max)[f]		Kyoto GHGs[e] [$GtCO_2$-eq] median (min–max)[f]	CO_2 only [$GtCO_2$] median (min–max)[f]		Kyoto GHGs[e] [$GtCO_2$-eq] median (min–max)[f]
				incl. AFOLU[g]	fossil fuels	incl. AFOLU[g]	incl. AFOLU[g]	fossil fuels	incl. AFOLU[g]
World	100	global	93	43 (38–51)	37 (33–45)	60 (54–68)	40 (35–45)/ 37 (35–39)	32 (26–39)/ 31 (27–37)	54 (50–60)/ 57 (49–63)
CHN	27	global	76	12 (9.7–15)	11 (8.4–14)	15 (12–18)	–/11 (9.8–13)	–/8.8 (6.9–13)	–/14 (13–16)
		national	13	12 (12–12)	11 (9.2–13)	15 (13–15)	–/12 (11–12)	–/11 (10–11)	–/15 (13–16)
USA[h]	12	global	71	4.9 (4.4–6.6)	4.6 (3.5–6.5)	5.9 (4.9–6.6)	–/3.8 (3.3–4.1)	–/3.9 (3.1–5.3)	–/4.6 (4–5.1)
		national	5	4.1	4.5 (4.1–4.9)	5.9 (5.2–6.7)	–/3.4	–/3.5	–/4.3
EU[i]	8.1	global	24	2.7 (2.1–3.5)	2.6 (2.1–3.3)	3.4 (2.6–4.7)	–/2.6 (2.1–2.8)	–/2.4 (2.1–2.7)	–/3.2 (2.6–3.7)
		national	3	3.1	2.6		–/2.5		
		official	3			3.2 (2.8–3.7)			
IND	7.1	global	79	3.7 (3–4.5)	3.2 (2.5–4.5)	4.7 (4.1–6.4)	3.3 (3.1–4.4)/4	3.3 (2.4–5.6)/3.8 (2.9–5.6)	5 (4.2–6.4)/5.8 (4.9–6.1)
		national	9	3.4 (3.3–4)	3.4 (2.9–3.9)	5.5 (5–5.7)	3.4 (3.2–3.6)/3.2	3.4 (3.2–3.5)/2.9	5.1/4.9
RUS	4.5	global	66	1.7 (0.84–2)	1.6 (1.5–2)	2.3 (1.6–3.3)	–/1.7 (0.85–1.9)	–/1.6 (1.2–1.9)	–/2.6 (1.9–3.1)
		national	6		1.5 (1.5–1.5)	2.6		–/1.5 (1.5–1.5)	–/2.5
		official	2			2.1			–/2.7
BRA	2.5	global	69	1.1 (0.79–1.7)	0.5 (0.28–1.1)	1.8 (1.4–2.7)	–/0.94 (0.52–1.5)	–/0.38 (0.097–0.86)	–/1.3 (1.2–2.5)
		national	4	0.59	0.47	1.8	–/0.51	–/0.47	–/1.2
		official	1						–/1.2
JPN	2.4	global	66	1.2 (0.94–1.3)	1.1 (0.67–1.3)	1.2 (0.95–1.3)	–/1 (0.9–1.2)	–/0.83 (0.65–1.2)	–/1 (0.95–1.2)
		national	16	1.1 (1.1–1.6)	1.1 (1.1–1.5)	1.3 (1.2–1.7)	–/0.93 (0.91–1.2)	–/0.93 (0.87–1.1)	–/1 (1–1.3)
		official	1						–/1
IDN	2.2	global	25	1.1 (0.79–2)	0.62 (0.51–0.89)	1.7 (1.4–2.4)	0.93 (0.76–1.4)/0.99	0.53 (0.45–0.66)/0.68 (0.6–0.77)	1.8 (1.3–2.1)/2.1 (1.5–2.2)
		official	2						1.9 (1.8–1.9)/2.2
CAN	1.5	global	67	0.58 (0.4–0.8)	0.43 (0.38–0.72)	0.68 (0.51–1)	–/0.43 (0.34–0.67)	–/0.43 (0.31–0.64)	–/0.53 (0.49–0.82)
		national	2	0.54		0.71	–/0.41		–/0.54
		official	2			0.67			
MEX	1.5	global	31	0.61 (0.54–1.3)	0.48 (0.3–0.56)	0.82 (0.72–1.7)	0.54 (0.48–1)/0.46	0.43 (0.27–0.54)/0.33 (0.26–0.42)	0.65 (0.62–1.4)/0.73 (0.63–0.79)
		official	2						0.62/0.76
SAU	1.5	global	6	0.7 (0.57–0.82)	0.61 (0.48–0.74)	1 (0.7–1.1)	0.7 (0.58–0.82)/–	0.62 (0.49–0.74)/–	0.83 (0.7–0.96)/–
KOR	1.4	global	64	0.69 (0.55–0.76)	0.67 (0.42–0.91)	0.72 (0.68–0.81)	–/0.57 (0.5–0.65)	–/0.4 (0.26–0.61)	–/0.57 (0.5–0.69)
		national	4	0.78 (0.75–0.81)	0.73 (0.7–0.76)	0.86 (0.83–0.89)	–/0.62 (0.51–0.72)	–/0.58 (0.49–0.67)	–/0.68 (0.56–0.8)
		official	1						
AUS	1.1	global	16	0.42 (0.34–0.49)	0.34 (0.28–0.46)	0.54 (0.46–0.69)	–/0.36 (0.28–0.43)	–/0.3 (0.24–0.41)	–/0.44 (0.39–0.52)
		national	3			0.55			
		official	2			0.52 (0.51–0.52)			
TUR	1.1	global	18	0.44 (0.44–0.49)	0.4 (0.34–0.43)	0.6 (0.51–0.83)	–/0.44 (0.44–0.49)	–/0.4 (0.27–0.43)	–/0.94 (0.55–1)
		official	1						–/0.93

Background of near-term GHG emissions assessment

Table 4.1 Assessment of projected 2030 emissions of current policies based on pre-COVID assumptions and original NDCs submitted in 2015/16 for 28 individual countries/regions and the world.

				Current Policies 2030 emissions			NDC 2030 emissions (conditional/unconditional)		
				CO_2 only [$GtCO_2$] median (min - max)		Kyoto GHGs [$GtCO_2$-eq] median (min - max)	CO_2 only [$GtCO_2$] median (min - max)		Kyoto GHGs [$GtCO_2$-eq] median (min - max)
Region	GHG share [%]	Type	# estimates	incl. AFOLU	fossil fuels	incl. AFOLU	incl. AFOLU	fossil fuels	incl. AFOLU
World	100	global	93	43 (38 - 51)	37 (33 - 45)	60 (54 - 68)	40 (35 - 45)/37 (35 - 39)	32 (26 - 39)/31 (27 - 37)	54 (50 - 60)/57 (49 - 63)
CHN	27	global	76	12 (9.7 - 15)	11 (8.4 - 14)	15 (12 - 18)	- /11 (9.8 - 13)	- /8.8 (6.9 - 13)	- /14 (13 - 16)
		national	13	12 (12 - 12)	11 (9.2 - 13)	15 (13 - 15)	- /12 (11 - 12)	- /11 (10 - 11)	- /15 (13 - 16)
USA	12	global	71	4.9 (4.4 - 6.6)	4.6 (3.5 - 6.5)	5.9 (4.9 - 6.6)	- /3.8 (3.3 - 4.1)	- /3.9 (3.1 - 5.3)	- /4.6 (4 - 5.1)
		national	5	4.1	4.5 (4.1 - 4.9)	5.9 (5.2 - 6.7)	- /3.4	- /3.5	- /4.3
EU	8.1	global	24	2.7 (2.1 - 3.5)	2.6 (2.1 - 3.3)	3.4 (2.6 - 4.7)	- /2.6 (2.1 - 2.8)	- /2.4 (2.1 - 2.7)	- /3.2 (2.6 - 3.7)
		national	3	3.1	2.6		- /2.5		
		official	3			3.2 (2.8 - 3.7)			
IND	7.1	global	79	3.7 (3 - 4.5)	3.2 (2.5 - 4.5)	4.7 (4.1 - 6.4)	3.3 (3.1 - 4.4)/4	3.3 (2.4 - 5.6)/3.8 (2.9 - 5.6)	5 (4.2 - 6.4)/5.8 (4.9 - 6.1)
		national	9	3.4 (3.3 - 4)	3.4 (2.9 - 3.9)	5.5 (5 - 5.7)	3.4 (3.2 - 3.6)/3.2	3.4 (3.2 - 3.5)/2.9	5.1/4.9
RUS	4.5	global	66	1.7 (0.84 - 2)	1.6 (1.5 - 2)	2.3 (1.6 - 3.3)	- /1.7 (0.85 - 1.9)	- /1.6 (1.2 - 1.9)	- /2.6 (1.9 - 3.1)
		national	6		1.5 (1.5 - 1.5)	2.6		- /1.5 (1.5 - 1.5)	- /2.5
		official	2			2.1			- /2.7
…									
GBR	0.86	global	4	0.37	0.33 (0.3 - 0.37)		- /0.37	- /0.33 (0.3 - 0.37)	
FRA	0.85	global	4	0.22	0.32 (0.24 - 0.4)		- /0.22	- /0.32 (0.24 - 0.4)	
UKR	0.52	global	2			0.42 (0.42 - 0.42)			- /0.54
SWE	0.13	global	4	-0.012	0.03 (0.029 - 0.031)		- /-0.012	- /0.03 (0.028 - 0.032)	
PRT	0.12	global	2	0.045	0.036		- /0.045	- /0.036	
		national	1					- /0.023	
CHE	0.09	global	1						- /0.026
		national	1	0.027	0.025				

Regional mitigation costs in 2050

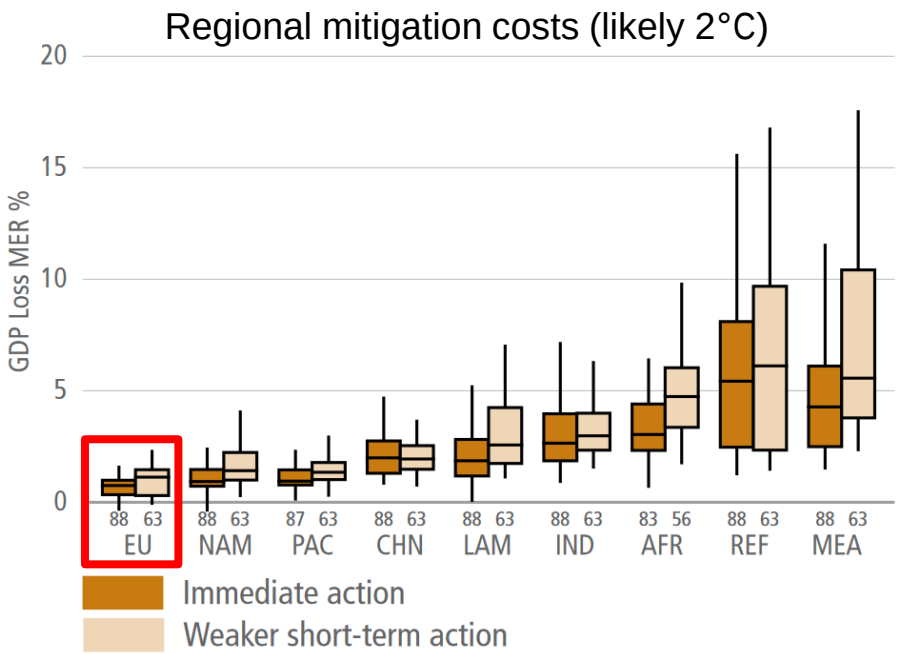


- Aggregate costs of mitigation relative to GDP are smaller in Europe compared to other regions.
- An equitable global emission trading scheme would require very large international financial transfers, in the order of several hundred billion USD per year (to which Europe would need to contribute).

Costs reflect cost-effective allocation of mitigation and do not consider any financial transfers or other equity considerations

Section 3.6, Figure 3.35

Regional mitigation costs in 2050

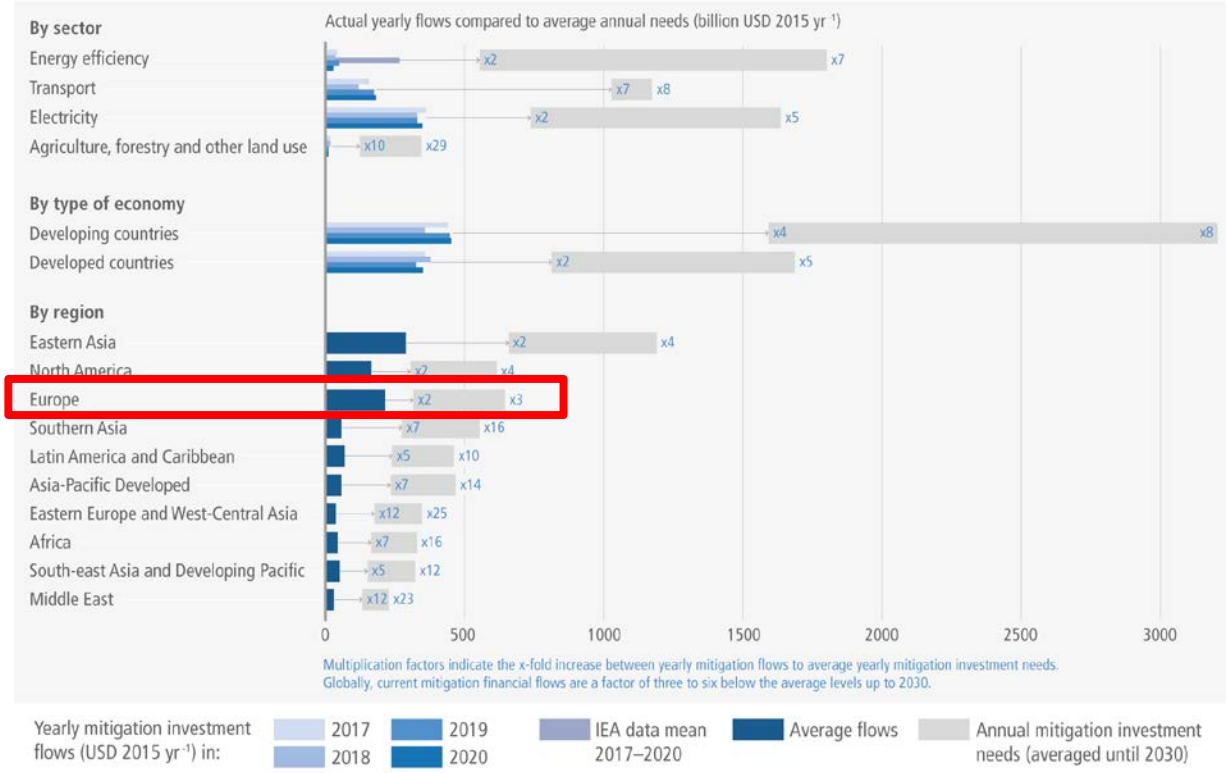


- Aggregate costs of mitigation relative to GDP are smaller in Europe compared to other regions.
- An equitable global emission trading scheme would require very large international financial transfers, in the order of several hundred billion USD per year (to which Europe would need to contribute).
- Delayed (global) action increases mitigation costs, also in Europe.

Costs reflect cost-effective allocation of mitigation and do not consider any financial transfers or other equity considerations

Section 3.6, Figure 3.35

Closing investment gaps



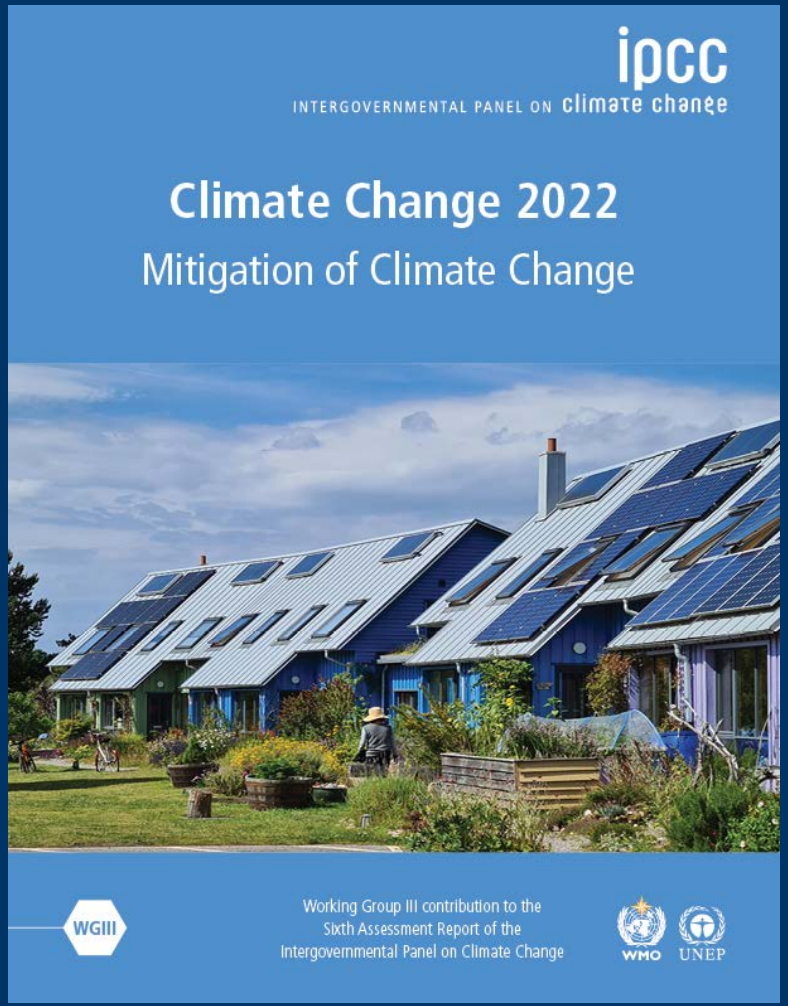
Financial flows

- Globally 3-6x lower than levels needed by 2030 to limit warming to below 1.5°C or 2°C
- For Europe this investment gap is smaller, requiring an upscaling of 2-3x by 2030

Figure TS.25

“

Thank you



[Matt Bridgestock, Director and Architect at John Gilbert Architects]