

Climate Change 2022

# Mitigation of Climate Change

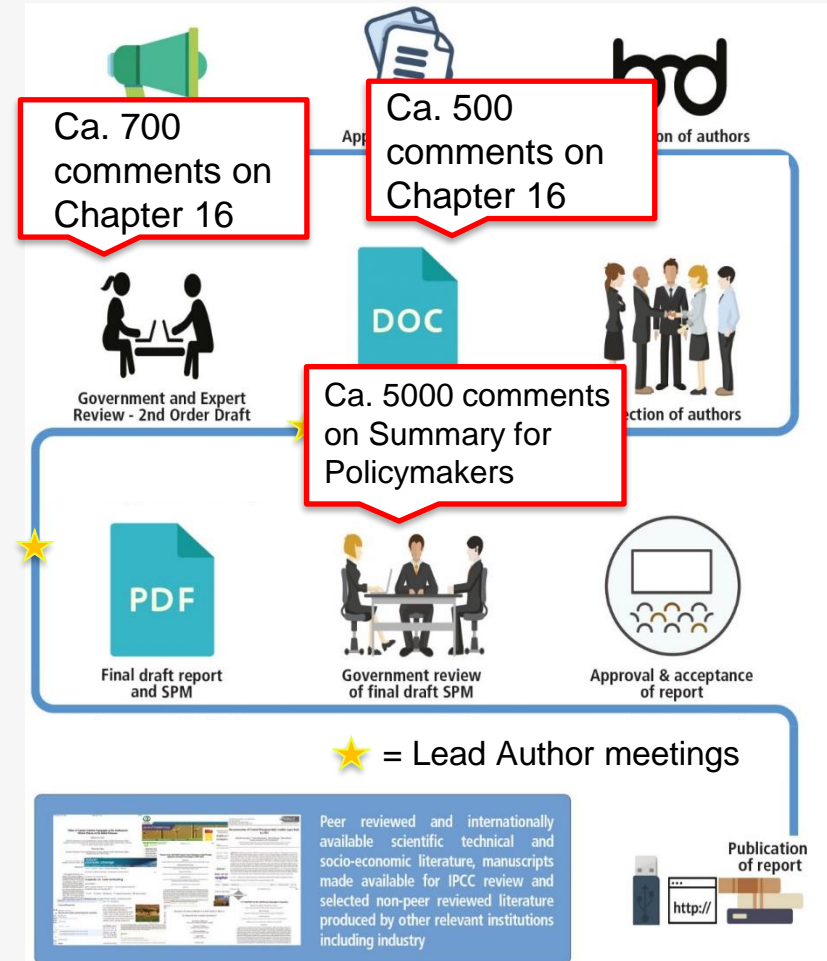


## Process for writing an IPCC report

### Key principles:

- Peer-reviewed literature
- Policy relevant, not policy-prescriptive

Governments influence: topic, outline, review, acceptance report & approval SPM



# Sixth Assessment Report

WORKING GROUP III – MITIGATION OF CLIMATE CHANGE

Comment ID	From Page	From Line	To Page	To Line	Category	Jump To Location	Sections	Reviewer	Affiliation	Comment	LEAD
30550	6	25	6	27	substance	<a href="#">Click link</a>	Section Executive Summary	Government of France	Ministère de la Transition écologique et solidaire	This subject should be further documented.	CLAs
60714	6	25	6	27	substance	<a href="#">Click link</a>	Section Executive Summary	Government of United States of America	U.S. Department of State	Report does not provide sufficient evidence to make a claim that active involvement by central banks is "necessary". Moreover, such a statement is not in line the IPCC principles to not be policy prescriptive.	CLAs
31704	6	25	6	32	editorial	<a href="#">Click link</a>	Section Executive Summary	Michael SUTHERLAND		The phrase "1.5°C-compatible worlds" can be confusing. How many worlds are there?	CLAs
36060	6	25	6	32	substance	<a href="#">Click link</a>	Section Executive Summary	Government of India	Ministry of Environment, Forests and Climate Change	Institutional capacity in financial sector, as emphasized in the Report, is needed. All sources of finance are important, given the enormity required. However contrary to what draft Report suggests, the multilateral development banks can come as a supportive channel to leverage climate finance. The front loading has to arrive from the financial pledges the developed country Parties have undertaken under the UNFCCC. Private sector finance also play a supportive and a critical additional role. This needs to be	CLAs
53136	6	25	6	32	substance	<a href="#">Click link</a>	Section Executive Summary	Westphal Michael	World Resources Institute	The section gives short shrift to other instruments for low-emission and adaptation investments, such as other derisking instruments, green bonds, and insurance. Also, 4.6 could also mention financial instruments that address co-benefits of climate action, such as social impact bonds that target health improvements from air pollution	CLAs
1860	6	26	6	26	substance	<a href="#">Click link</a>	Section Executive Summary	Willem Pieter Pauw	German Development Institute/ Deutsches Institut für Entwicklungspolitik (DIE)	I would include bilateral banks too. And commercial banks	CLAs
31504	6	26	6	26	substance	<a href="#">Click link</a>	Section Executive Summary	Government of Japan	Climate Change Division, Ministry of Foreign Affairs	We would suggest mentioning not only central and multilateral banks but also financial regulatory authorities because in some countries, functions are distinguished between the central bank and the financial regulatory authority.	CLAs
							Section Executive Summary	Amory Lovins	Rocky Mountain Institute	I doubt that up-to-date models (which no IAMs are) would show "front-loading of investments compared to current actions is unavoidable". IAMs tend to use old and fixed cost data (especially for wind and solar power), and sometimes to assume largely or wholly unnecessary bulk electrical storage ( <a href="http://dx.doi.org/10.1016/j.tej.2017.11.006">http://dx.doi.org/10.1016/j.tej.2017.11.006</a> ), rather than to assume observed experience/scaling curves and least-cost grid	

## Summary for Policymakers Approval : 1 to 6 October 2018



Image: ENB. Plenary room in Incheon, Korea

# Sixth Assessment Report

WORKING GROUP III – MITIGATION OF CLIMATE CHANGE

## Summary for Policymakers Approval AR6 WGIII report 21 March – 3 April

Online

Longest IPCC approval ever

Controversies on fossil fuels, finance,  
justice and equity



Lavanya Rajamani, Chapter 14 Coordinating Lead Author



Maria Jishi, Saudi Arabia



Aya Takatsuki, Japan



Christiane Textor, Germany



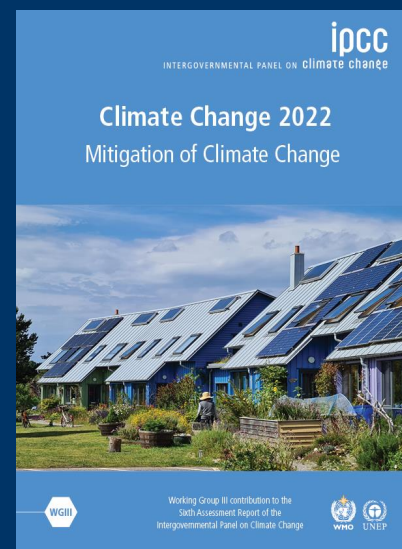
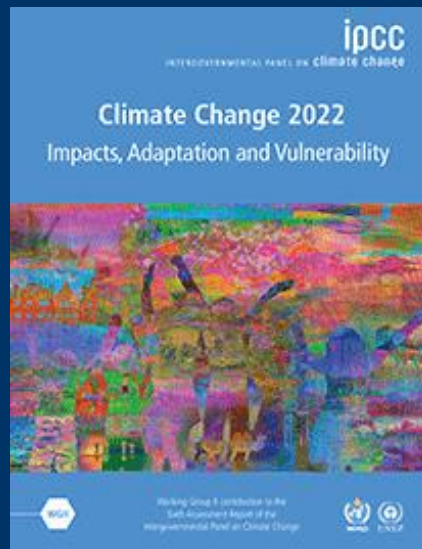
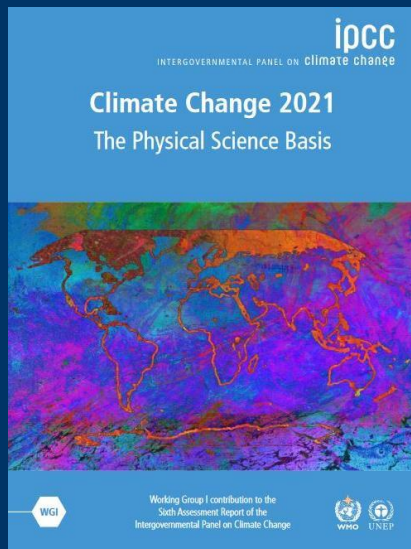
Farhan Akhtar, US



Vera Olaers, the Netherlands



Friedemann Call, Germany



# Report by numbers



278 Authors



65 Countries



41 % Developing countries  
59 % Developed countries



354 Contributing  
authors



29 % Women / 71 % Men



More than  
18,000 scientific papers



59,212 Review comments

ipcc

INTERGOVERNMENTAL PANEL ON climate change

# Climate Change 2022

## Mitigation of Climate Change



WGIII

Working Group III contribution to the  
Sixth Assessment Report of the  
Intergovernmental Panel on Climate Change



ipcc 

## Key messages

The window to limit warming to 1.5°C is closing, and we are not on track

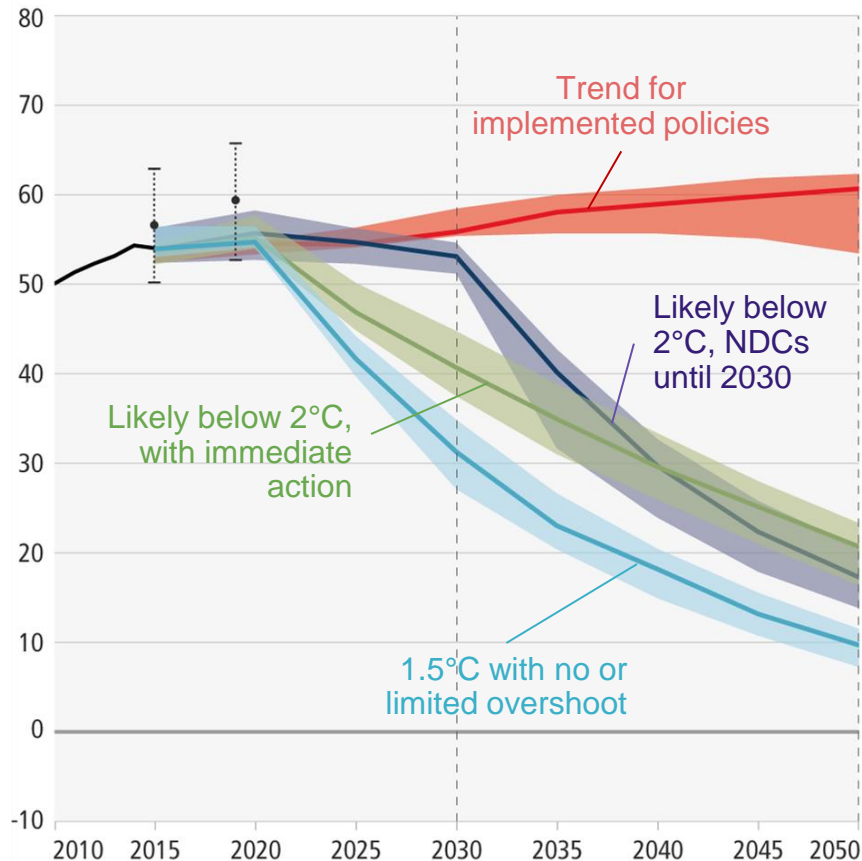
Accelerated mitigation is needed

Many options are feasible in the near term, and are in line with sustainable development goals

System transformations needed can be enabled by finance, governance, policy, capacity, innovation and behaviour

Just transitions and national circumstances are important determinants for success





## Limiting warming to 1.5 °C

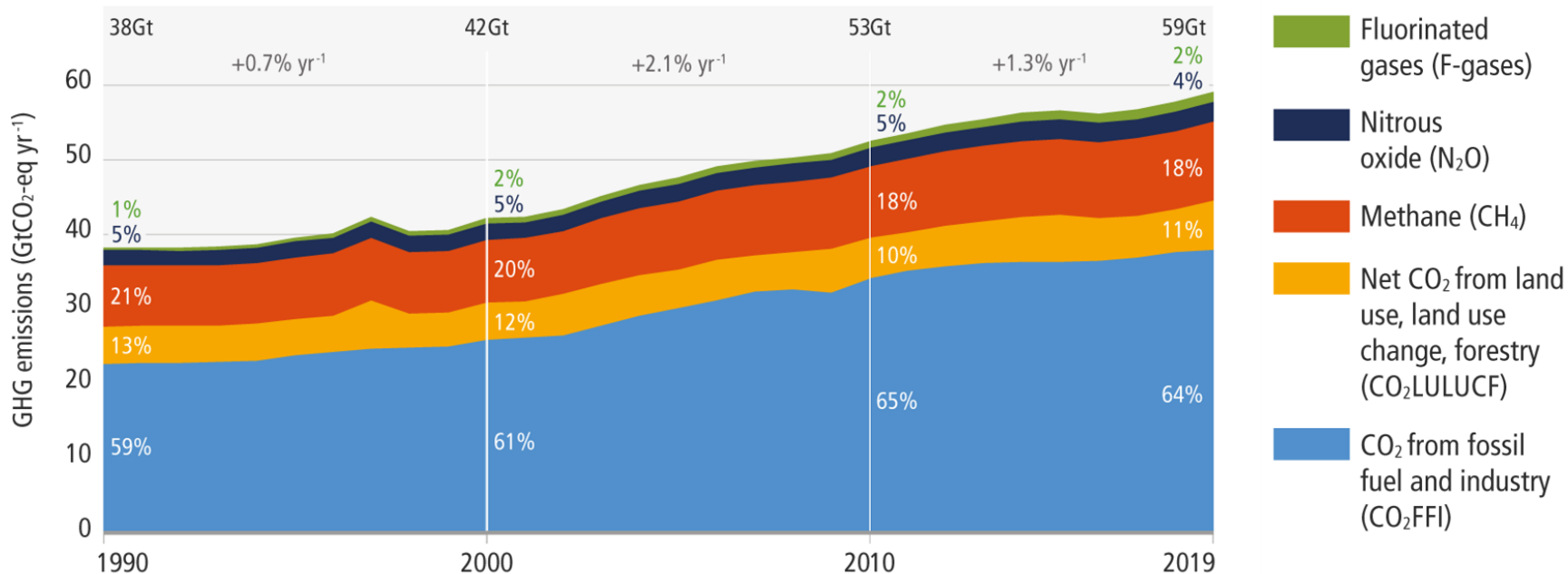
- Global GHG emissions peak before 2025, reduced by 43% by 2030.
- Net zero CO<sub>2</sub> by ca. 2050
- Methane reduced by 34% by 2030

## Limiting warming to around 2°C

- Global GHG emissions peak before 2025, reduced by 27% by 2030.

*(based on IPCC-assessed scenarios)*

## Emissions have risen further in the past decade and we are not on track to limit warming to 1.5°C...



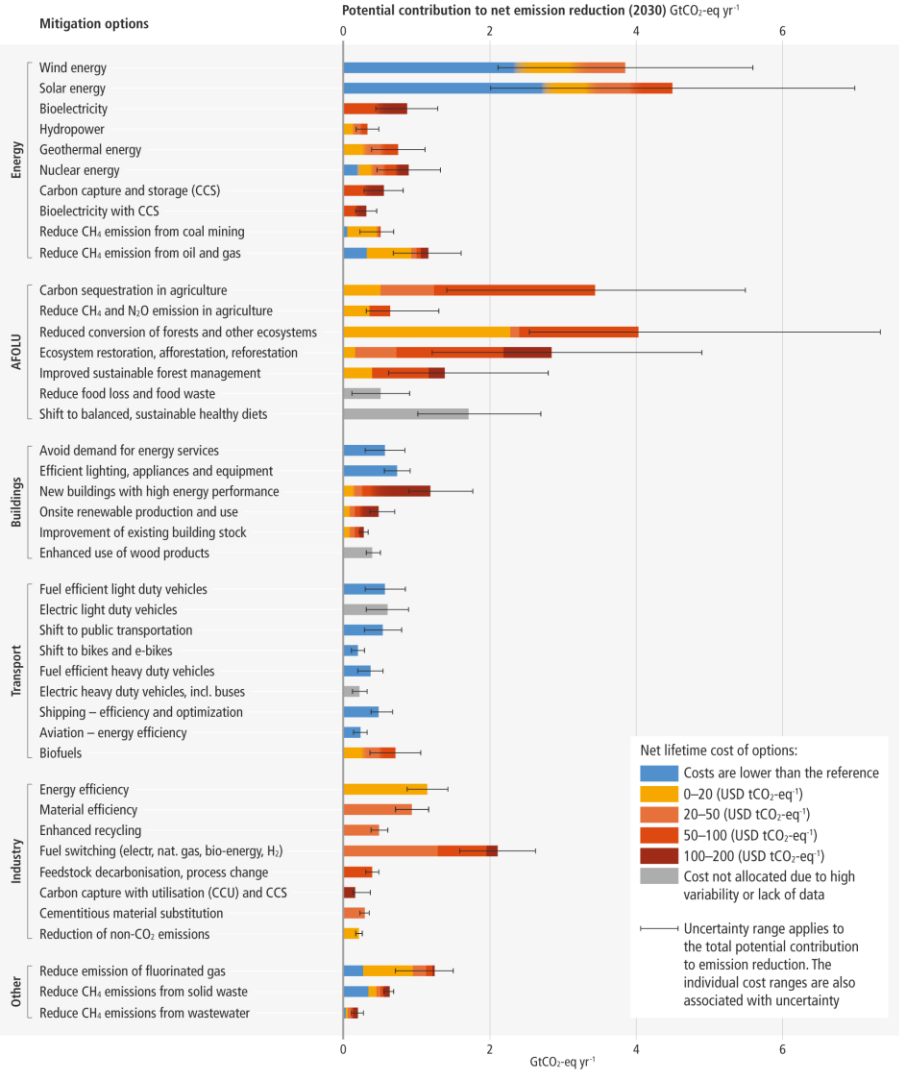
## ...but there is increased evidence of climate action



Some countries have achieved a **steady decrease** in emissions **consistent** with limiting warming to **2°C**.



**Zero emissions targets** have been adopted by at least **826 cities** and **103 regions**



Many near-term actions are feasible

Global emissions can be halved with available mitigation options below 100 USD/tCO<sub>2</sub>e

Almost all mitigation options face institutional barriers

Many mitigation options are synergistic with sustainable development goals

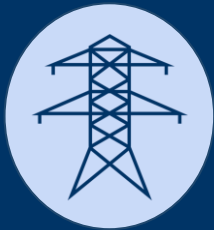


# Mitigation options in agriculture and forestry

## Relation with Sustainable Development Goals

	1	2	3	4	5	6	7	8	9	10	11	12	14	15	16	17
Carbon sequestration in agriculture <sup>1</sup>	+	+	•			+		+				•	+	+	+	
Reduce CH <sub>4</sub> and N <sub>2</sub> O emission in agriculture		•	+			•			•			+	+	+		
Reduced conversion of forests and other ecosystems <sup>2</sup>	•	-	+			+		•			•		+	+	•	•
Ecosystem restoration, reforestation, afforestation	+	•	+			•		-		•	+		+	+		
Improved sustainable forest management	+	•	•			+	•	+	+	•	•		+	+		
Reduce food loss and food waste	+	+	+			+	+			+	+	+	+	+	+	+
Shift to balanced, sustainable healthy diets	•	•	+			+	+		•	+	+	+	+	+		
Renewables supply <sup>3</sup>	•	•	•			•	•	+	+				•	•		

# System transformations across multiple sectors needed to limit global warming



**Energy**



**Land use**



**Industry**



**Urban**



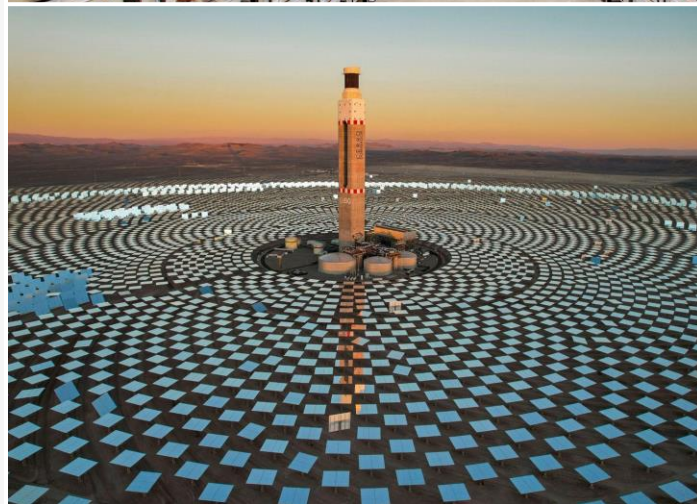
**Buildings**



**Transport**

## Energy

- **major transitions** are required to limit global warming
- reduction in fossil fuel use and use of carbon capture and storage
- low- or **no-carbon** energy systems
- widespread **electrification** and improved energy **efficiency**
- **alternative fuels**: e.g. hydrogen and sustainable biofuels



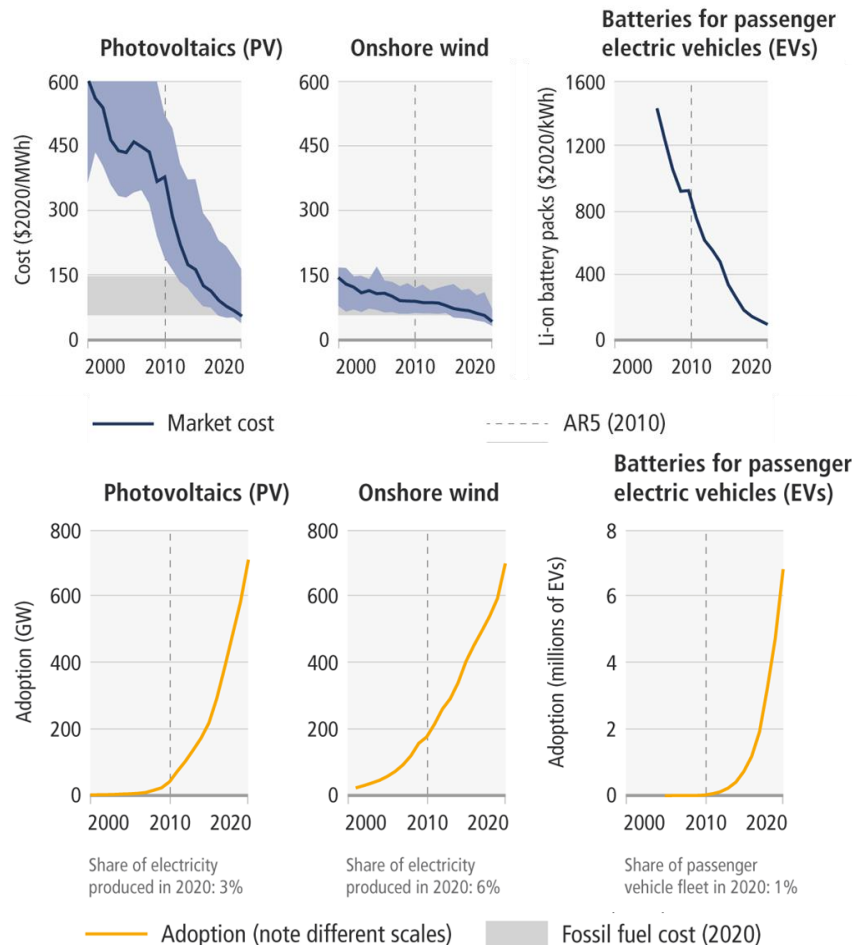
[Portland General Electric CC BY-ND 2.0, Harry Cunningham/Unsplash, Stéphane Bellerose/UNDP in Mauritius and Seychelles CC BY-NC 2.0, IMF Photo/Lisa Marie David, Tamara Merino CC BY-NC-ND 2.0]



## Technology and Innovation

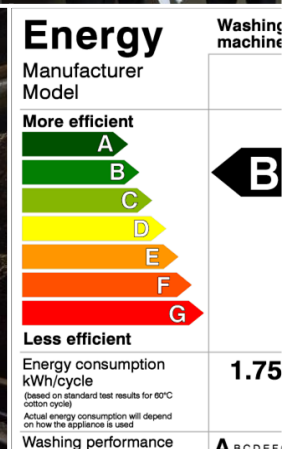
- investment and policies **push forward low emissions technological innovation**
- **some options** are technically **viable**, rapidly becoming **cost-effective**, and have relatively **high public support**. Other options face mainly institutional barriers

**Adoption of low-emission technologies is slower in most developing countries, particularly the least developed ones.**

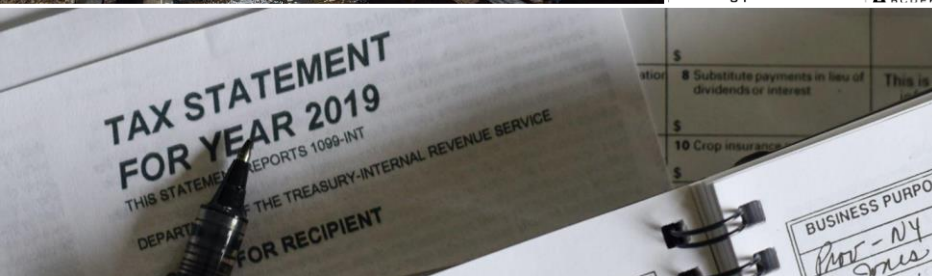




# Policies, regulatory and economic instruments



- regulatory and economic instruments have **already proven effective** in reducing emissions
- **policy packages** and **economy-wide packages** are able to achieve **systemic change**
- ambitious and effective mitigation requires **coordination across government and society**

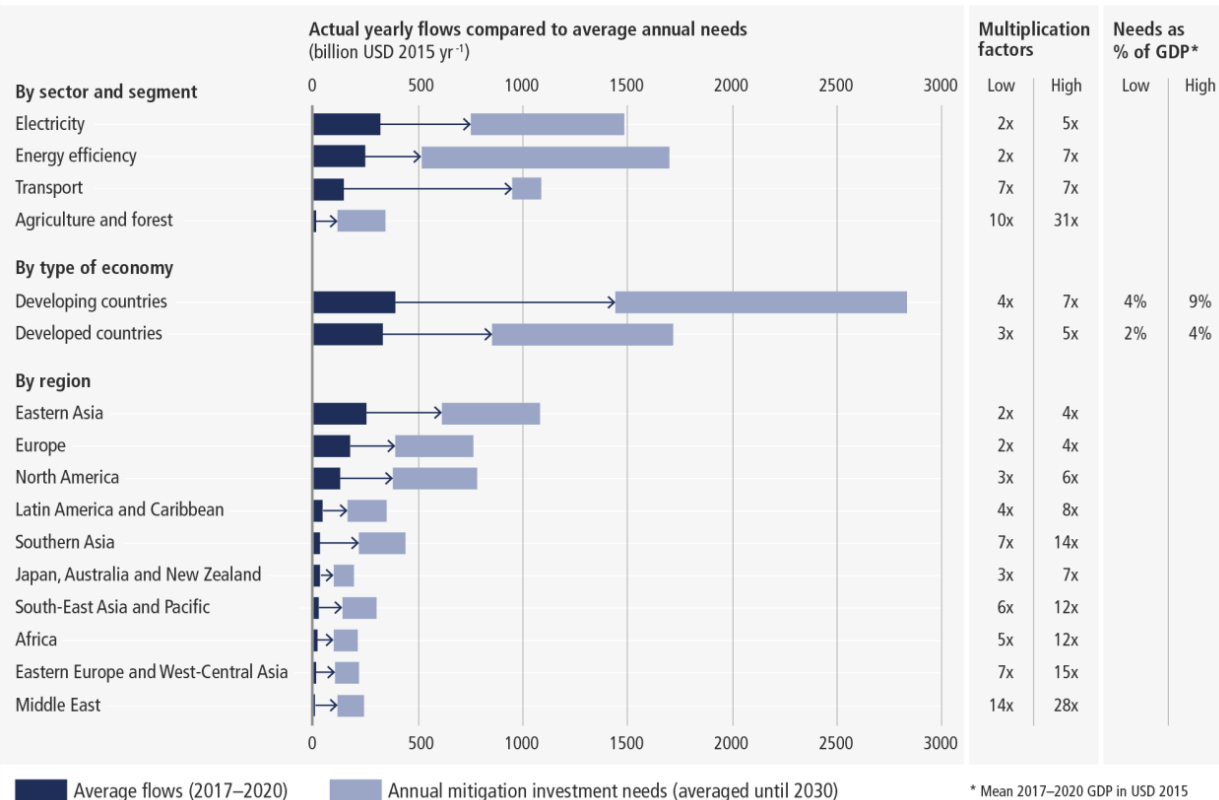


[World Bank/Simone D. McCourtie, Dominic Chavez CC BY-NC-ND 2.0, Trent Reeves/MTA Construction & Development CC BY 2.0, IMF Photo/Tamara Merino CC BY-NC-ND 2.0, Olga Delawrence/Unsplash.]

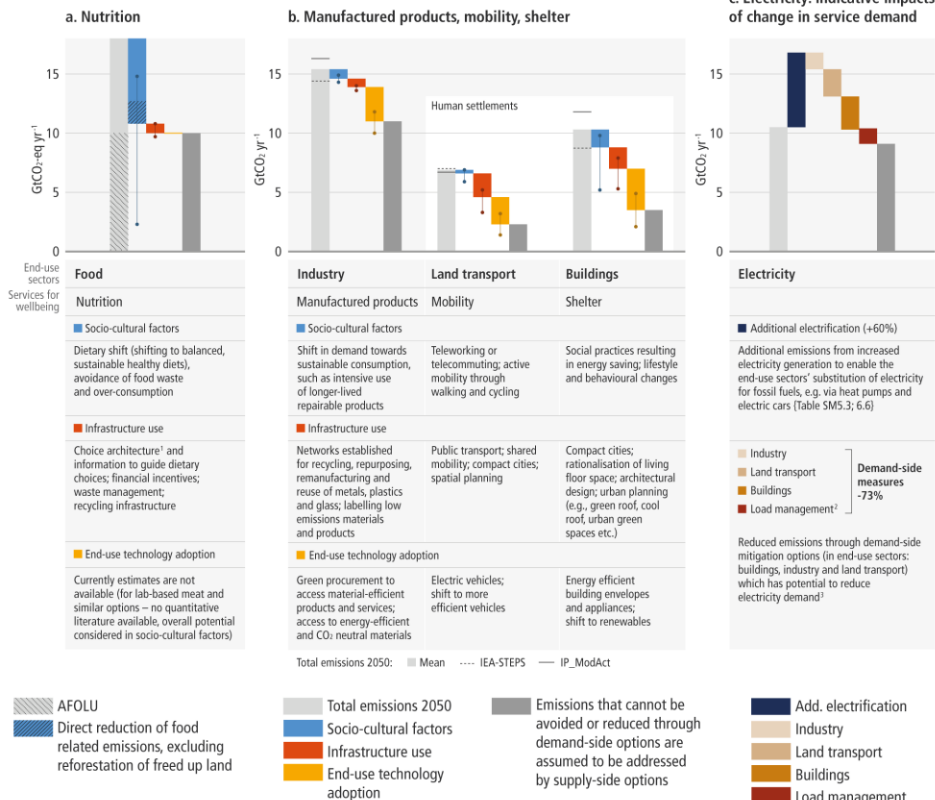
# Closing investment gaps

Mitigation investment flows fall short of investment needs across all sectors and types of economy, particularly in developing countries.

- financial flows: **3-6x lower** than levels needed **by 2030** to limit warming to below 1.5°C or 2°C
- there is **sufficient global capital** and liquidity to close investment gaps
- challenge of closing gaps is widest for developing countries



Demand-side mitigation can be achieved through changes in socio-cultural factors, infrastructure design and use, and end-use technology adoption by 2050.



# Behaviour change and demand-side measures

- potential to bring down global emissions by **40-70%** by 2050
- walking and cycling, electrified transport, reducing air travel, and adapting houses make large contributions
- **lifestyle changes require systemic changes** across all of society
- **some people require additional housing, energy and resources** for human wellbeing

<sup>1</sup> The presentation of choices to consumers, and the impact of that presentation on consumer decision-making.

<sup>2</sup> Load management refers to demand-side flexibility that cuts across all sectors and can be achieved through incentive design like time of use pricing/monitoring by artificial intelligence, diversification of storage facilities, etc.

<sup>3</sup> The impact of demand-side mitigation on electricity sector emissions depends on the baseline carbon intensity of electricity supply, which is scenario dependent.

“ The evidence is clear:  
The time for action is now

**Climate Change 2022**  
Mitigation of Climate Change

