## **Supplementary information**

To accompany a Comment published in *Nature* **579**, 25–28 (2020) https://doi.org/10.1038/d41586-020-00571-x

# Emissions: world has four times the work or one-third of the time

Niklas Höhne, Michel den Elzen, Joeri Rogelj, Bert Metz, Taryn Fransen, Takeshi Kuramochi, Anne Olhoff, Joseph Alcamo, Harald Winkler, Sha Fu. Michiel Schaeffer, Roberto Schaeffer, Glen P. Peters, Simon Maxwell & Navroz K. Dubash

### **Supplementary information**

### **Comment:** Emissions: four times the work or one-third of the time

Niklas Höhne, Michel den Elzen, Joeri Rogelj, Bert Metz, Taryn Fransen, Takeshi Kuramochi, Anne Olhoff, Joseph Alcamo, Harald Winkler, Fu Sha, Michiel Schaeffer, Roberto Schaeffer, Glen Peters, Simon Maxwell, Navroz K. Dubash

DOI: 10.1038/d41586-020-00571-x

### Acknowledgements

The authors thank the numerous contributors to 10 editions of the UNEP Emission Gap Report, in particular the modellers that prepared and made available their results, without which the report could not have been prepared. The most recent version of the report drew from a database of 85 scenarios compiled in the context of the IPCC Special Report on Global Warming of 1.5°C, as well as projections under countries' pledges from 12 modelling groups.

#### **Tables**

Table 1. Overview of the number of ambitious climate actions and targets by countries, regions, cities and businesses (for full details, see¹ updated using¹. A regularly updated version of this table is available online (www.newclimate.org/ambitiousactions). Given the scope of existing policies and rapid change in policymaking, the table makes no claim to be exhaustive. Greyed cells indicate that no data is available or it is not relevant.

	Countries	Regions	Cities	Businesses
Overarching economy-wide time bound climate				
actions				
Achieve zero emissions	76	14	>400	>8000
Implement ambitious comprehensive CO <sub>2</sub> pricing	(30 but not	(25 but not		
in all sectors	comprehensive)	comprehensive)		
Phase out all fossil-fuel subsidies	(Decision by			
	G20 in 2009 yet			
	to be			
	implemented)			
Make all finance flows consistent with the Paris	(>1 initial			>11
Agreement goals	steps)			
Electricity production				
Reach 100 per cent renewable electricity or 100	53	31	>160	>210
per cent carbon-free electricity			ļ	
Phase out coal-fired power plants with just a	21	21	6	37
transition plan				
Stop financing and insuring coal-fired power	-			>20
plants elsewhere				
Other energy industry				
Stop new fossil-fuel explorations and production	6			>5
Commit to zero fugitive emissions target	(32 support			>15
	zero routine			
	flaring)			
Industry				
Ensure all new installations are low- carbon/zero-	-			>3
emission and maximize material efficiency				
Implement ambitious carbon pricing for industry	1	-		
Transport				
Shift to x per cent public transport	4	-	>5	
Shift to 100 per cent share of new zero-emission	21	5	>52	>65
motorbikes, cars and/or buses				
Shift to 100 per cent carbon-free heavy goods	-	-		>11
transport and ships	(1. 1	(4.1		
Shift to 100 per cent carbon-free aviation	(1 short haul)	(1 domestic)		-
Buildings	_	_		
Shift to 100 per cent (near-) zero energy buildings	3	6	>28	>44
for new buildings				
Fully decarbonize the building sector	1	6	>28	>44
Phase out fossil fuels (for example, gas) for	1	-	>3	
residential heating	(4 11:			
Increase the rate of zero-energy renovations	(1 public	-		
And other and formation	buildings)			
Agriculture and forestry	. 00	22		. 70
Zero net deforestation	>80	23		>73

<sup>&</sup>lt;sup>i</sup> https://unfccc.int/news/climate-ambition-alliance-nations-renew-their-push-to-upscale-action-by-2020-and-achieve-net-zero

Table 2. Current policy projections of the UNEP Emissions gap report 2015<sup>2</sup>

Country	Histo	Current policies 2030		
	1990	2010	Central	
China	3,512	9,993	14,420	
USA	5,633	6,389	6,006	
EU	5,385	4,594	3,713	
India	1,247	2,579	4,762	
Russia	3,395	1,968	2,006	
Indonesia	975	1,665	1,999	
Brazil	1,558	1,468	1,380	

(The historical emissions are expressed using global warming potentials (GWPs) from the IPCC Second Assessment Report, while the projections are based on the values reported in the literature using different GWPs. Values are not strictly comparable with those in Table 3 due to use of different GWPs and different values or methods to estimate the historical emissions, and the use of more national and global models to estimate projections.)

Table 3. Current policy projections of the UNEP Emissions gap report 2019<sup>1</sup>

Country	Historical		Current policies 2030 (official data)	Current policies 2030 (independ ent)		
	1990	2010		Central	Min	Max
China	2,475	10,345		14,895	13,162	17,848
USA	5,564	6,269		5,768	5,060	6,644
EU	5,405	4,469	2,810	3,135	2,799	3,488
India	1,240	1,941		4,781	3,999	5,350
Russia	3,113	1,331		2,146	1,842	2,350
Indonesia	478	1,154		2,224	1,453	2,846
Brazil	1,497	1,401		1,579	1,305	1,789

(All projections from the literature were harmonised to GWPs from the IPCC Fourth Assessment Report, AR4. Values are not strictly comparable with those in Table 2 due to use of different GWPs and different values or methods to estimate the historical emissions, and the use of more national and global models to estimate projections.)

#### References

- 1. UNEP. *Emissions Gap Report 2019*. (United Nations Environment Programme, 2019). doi:10.18356/ff6d1a84-en
- 2. UNEP. *The Emissions Gap Report 2015: A UNEP Synthesis Report*. (United Nations Environment Programme (UNEP), 2015).