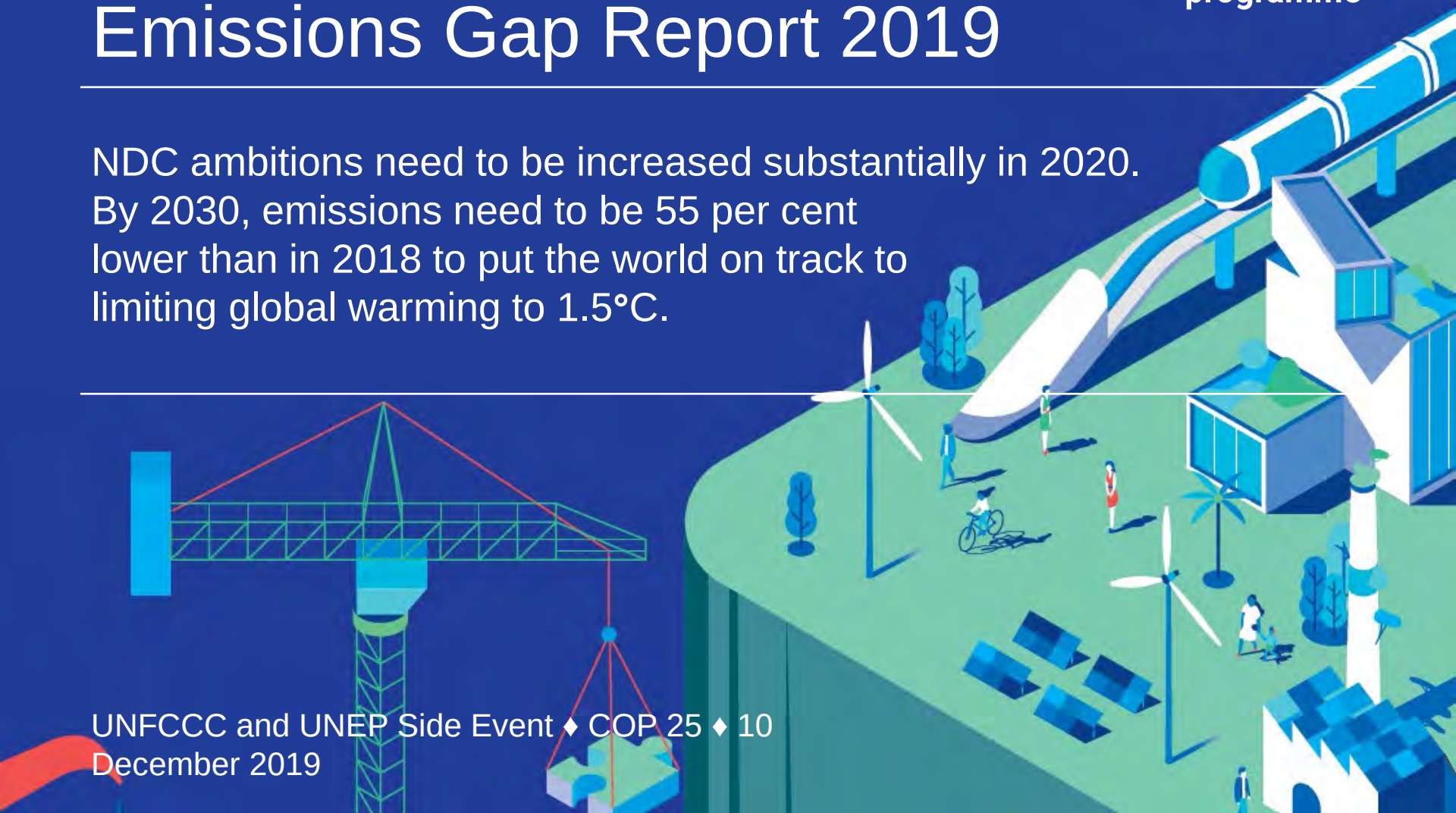
Emissions Gap Report 2019

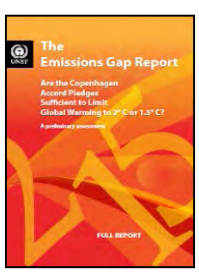
NDC ambitions need to be increased substantially in 2020. By 2030, emissions need to be 55 per cent lower than in 2018 to put the world on track to limiting global warming to 1.5°C.

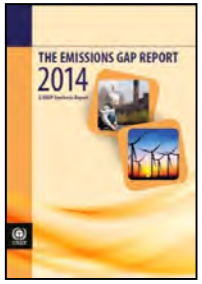


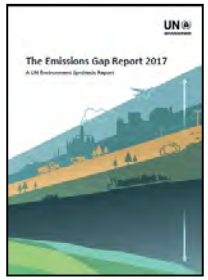
UNFCCC and UNEP Side Event ♦ COP 25 ♦ 10 December 2019

UNEP Emissions Gap Reports

10 years of emissions gap assessments







Emissions Gap Report 2019 - prepared by 57 leading scientists from 33 expert institutions across 25 countries

Chapter 1: Anne Olhoff and John Christensen (UNEP DTU Partnership)

Chapter 2: Takeshi Kuramochi (NewClimate Institute), Michel den Elzen (PBL Netherlands Environmental Assessment Agency), Glen Peters (CICERO), Andrzej Ancyger (Climate Analytics), Ankit Bhardwaj (Centre for Policy Research), Gabriel Blanco (National University of the Center of the Buenos Aires Province), Taryn Fransen (World Resources Institute (WRI)), Andreas Geiges (Climate Analytics), Frederic Hans (NewClimate Institute), Christopher Henderson (World Resources Institute), Niklas Höhne (NewClimate Institute), Kejun Jiang (Energy Research Institute), Maria Jose de Villafranca (NewClimate Institute), Kimon Keramidas (Joint Research Centre/European Commissions), Joojin Kim (Solutions For Our Climate), Akihisa Kuriyama (Institute for Global Environmental Strategies (IGES)), Leonardo Nascimento (NewClimate Institute), Jos Olivier (PBL), Deger Saygin (SHURA), Ranping Song (WRI), Claire Stockwell (Climate Analytics), Kentaro Tamura (IGES), Paola Tanguy (NewClimate Institute), Heleen van Soest (PBL), Jorge Villarreal Padilla (Iniciativa Climática de México), Ryan Wilson (Climate Analytics), William Wills (Centro Clima), Paola Yanguas Parra (Climate Analytics)

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Chapter 6: Yacob Mulugetta (University College London), Pablo E. Carvajal (International Renewable Energy Agency), James Haselip (UNEP DTU Partnership), Thomas Spencer (The Energy and Resources Institute), Edo Abraham (Delft University of Technology), Simon Batchelor (Gamos Ltd,), Brigitte Knopf (Mercator Research Institute on Global Commons and Climate Change)

Chapter 7: Edgar Hertwich (Norwegian University of Science and Technology), Reid Lifset (Yale School of Forestry & Environmental Studies), Stefan Pauliuk (University of Freiburg), Niko Heeren (Yale School of Forestry & Environmental Studies), Saleem Ali (University of Delaware), Peter Berrill (Yale School of Forestry & Environmental Studies), Tomer Fishman (Interdisciplinary Center Herzliya), Qingshi Tu (Yale School of Forestry & Environmental Studies), Paul Wolfram (Yale School of Forestry & Environmental Studies)

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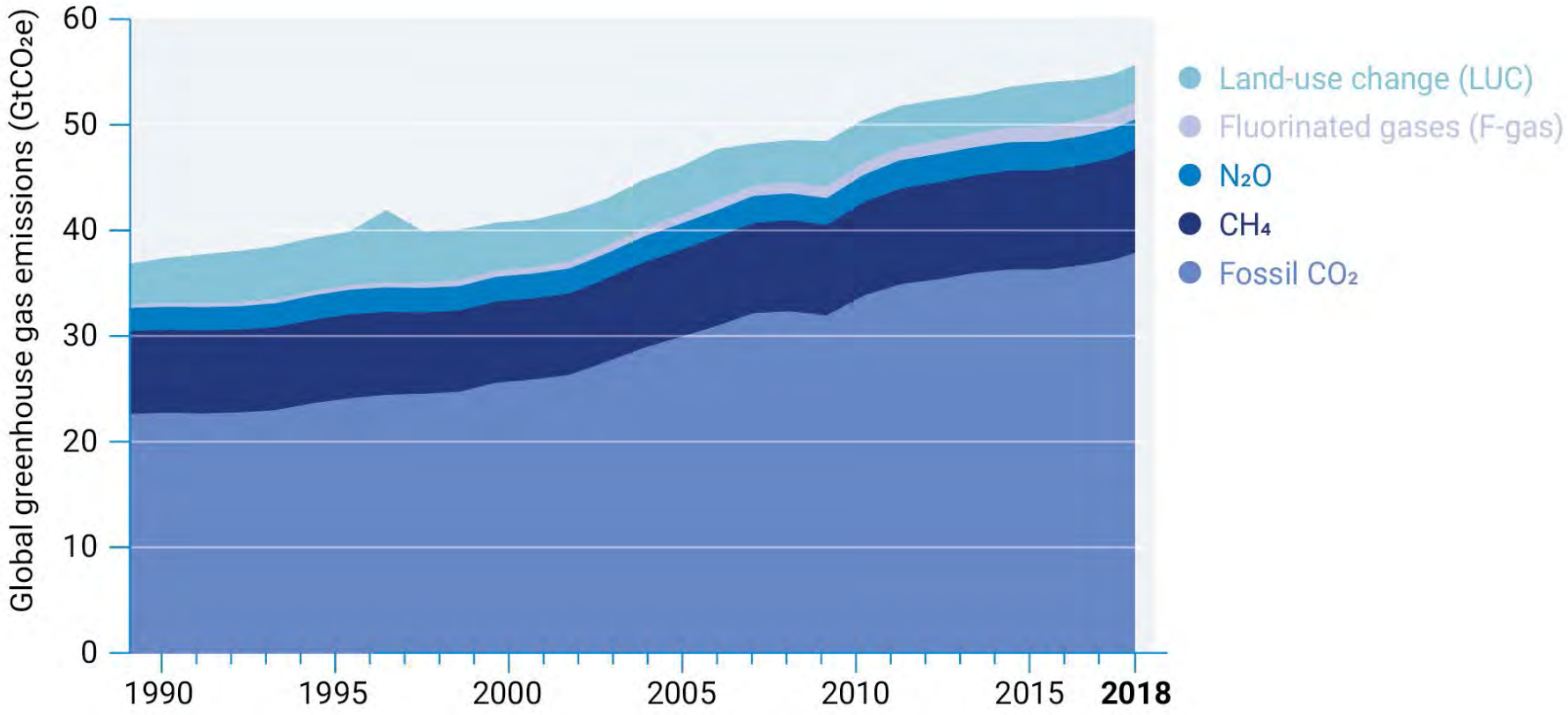
Emissions Gap Report 2019 - main questions

- What is the trend in global GHG emissions?
- Are countries on track to meet their NDC targets?
- What will the current NDCs contribute?
- Will this be sufficient to stay well below 2°C and pursue 1.5°C?
- Can the 2030 Gap be bridged - and how?

Global greenhouse gases have risen 1.5 per cent per year in the last decade, reaching a record high of 55.3 $GtCO_2e$ in 2018

Global GHGs from all sources



Source: Olivier and Peters (2019), Houghton and Nassikas (2017) for land-use change emissions, and Friedlingstein *et al*. (2019) for updates from 2016 to 2018

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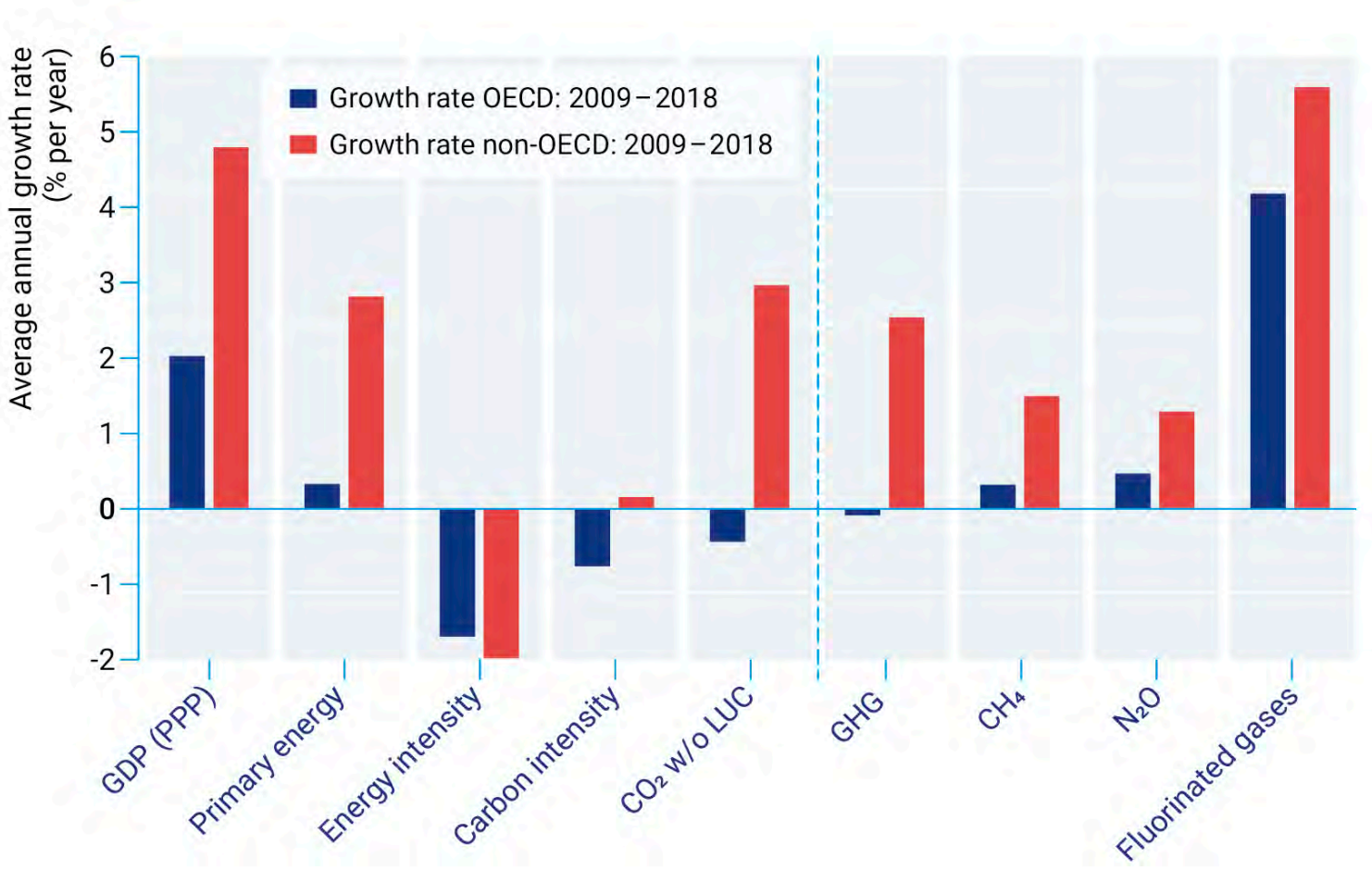
Average annual growth rates of key drivers of global CO_2 emissions (2009-2018)

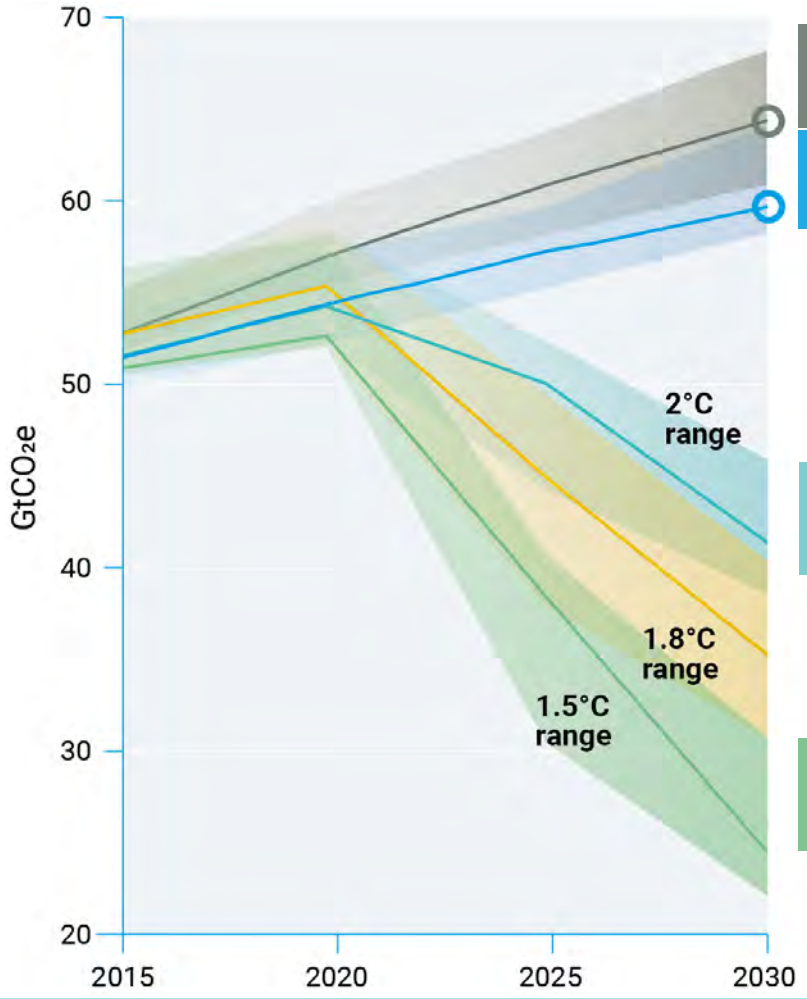


Source: Olivier and Peters (2019) and Global Carbon Project (Friedlingstein *et al*. 2019) for energy and economic data

Progress towards achieving the NDC commitments of the G20 members

Projected to meet the unconditional NDC target with currently implemented policies		Expected to meet the unconditional NDC target with additional policy measures and/or stricter enforcement of existing policies		Uncertain or insufficient information
Overachievement of the target by more than 15 per cent, suggesting a weak target	Overachievement of the target by less than 15 per cent	Projected emissions 0–15 per cent above the NDC target	Projected emissions 15 per cent or more above the NDC target	
• **India** (6 of 6 studies) • **Russia** (3 of 3 studies) [1)] • **Turkey** (3 of 3 studies)	• **China** (3 of 5 studies, one uncertain) [2)] • **EU28** (1 of 3 studies, one uncertain) [1),2),3)] • **Mexico** (2 of 3 studies)	• **Australia** (3 of 4 studies) [1)] • **Japan** (2 of 3 studies) • **South Africa** (3 of 3 studies) [1),4)]	• **Brazil** (4 of 4 studies) • **Canada** (3 of 3 studies) [1)] • **Republic of Korea** (3 of 3 studies) • **United States of America** (2025) (5 of 5 studies) [1)]	• **Argentina** (1 of 3 studies projected to meet the unconditional NDC; updated NDC in 2016) • **Indonesia** (3 studies disagree) • **Saudi Arabia** (2 studies disagree)

NDC contributions and the Emissions Gap



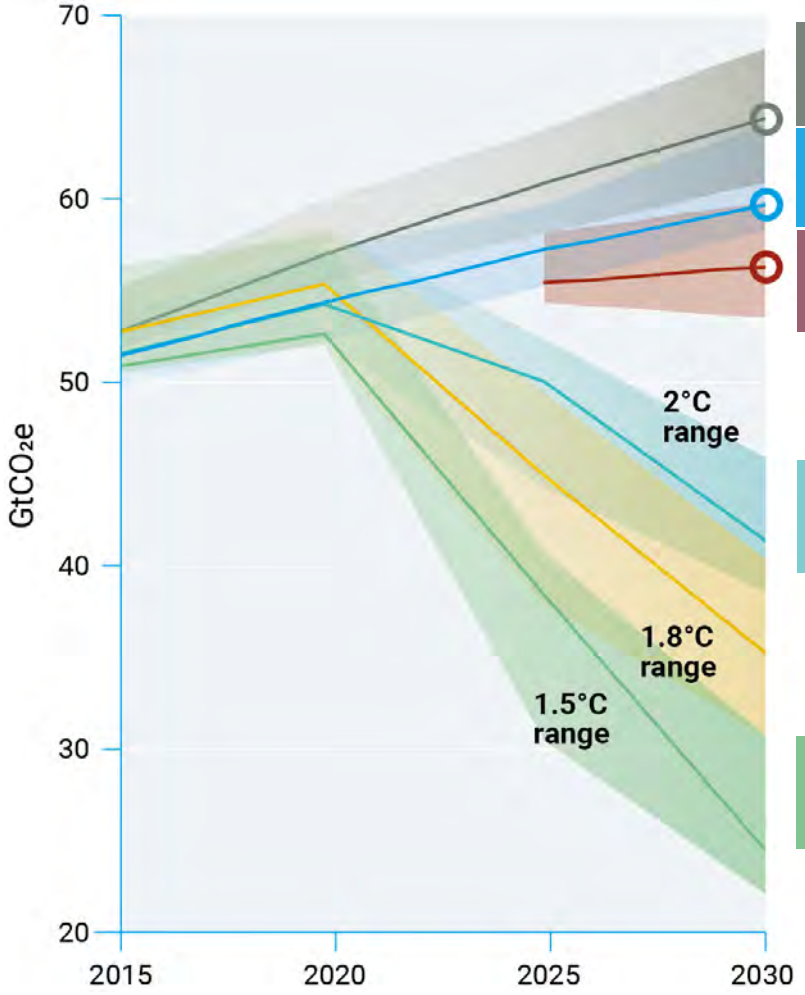
2005-Policies scenario
Global total emissions **64 $GtCO_2e$** (range: 60-68)

Current policy scenario
Global total emissions **60 $GtCO_2e$** (range: 58-64)

2°C pathways
Global total emissions **41 $GtCO_2e$** (range: 39-46)

1.5°C pathways
Global total emissions **25 $GtCO_2e$** (range: 22-31)

NDC contributions and the Emissions Gap



2005-Policies scenario
Global total emissions **64 $GtCO_2e$** (range: 60-68)

Current policy scenario
Global total emissions **60 $GtCO_2e$** (range: 58-64)

Unconditional NDC scenario
Global total emissions **56 $GtCO_2e$** (range: 54-60)

2°C pathways
Global total emissions **41 $GtCO_2e$** (range: 39-46)

1.5°C pathways
Global total emissions **25 $GtCO_2e$** (range: 22-31)

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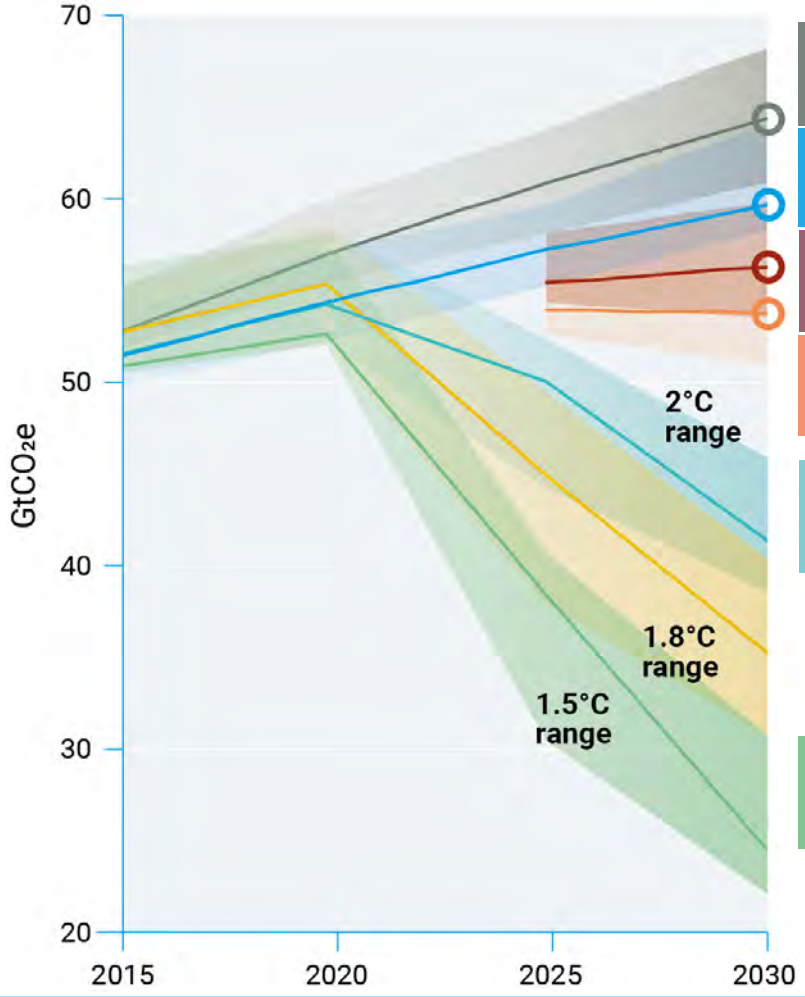
NDC contributions and the Emissions Gap



2005-Policies scenario
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Current policy scenario
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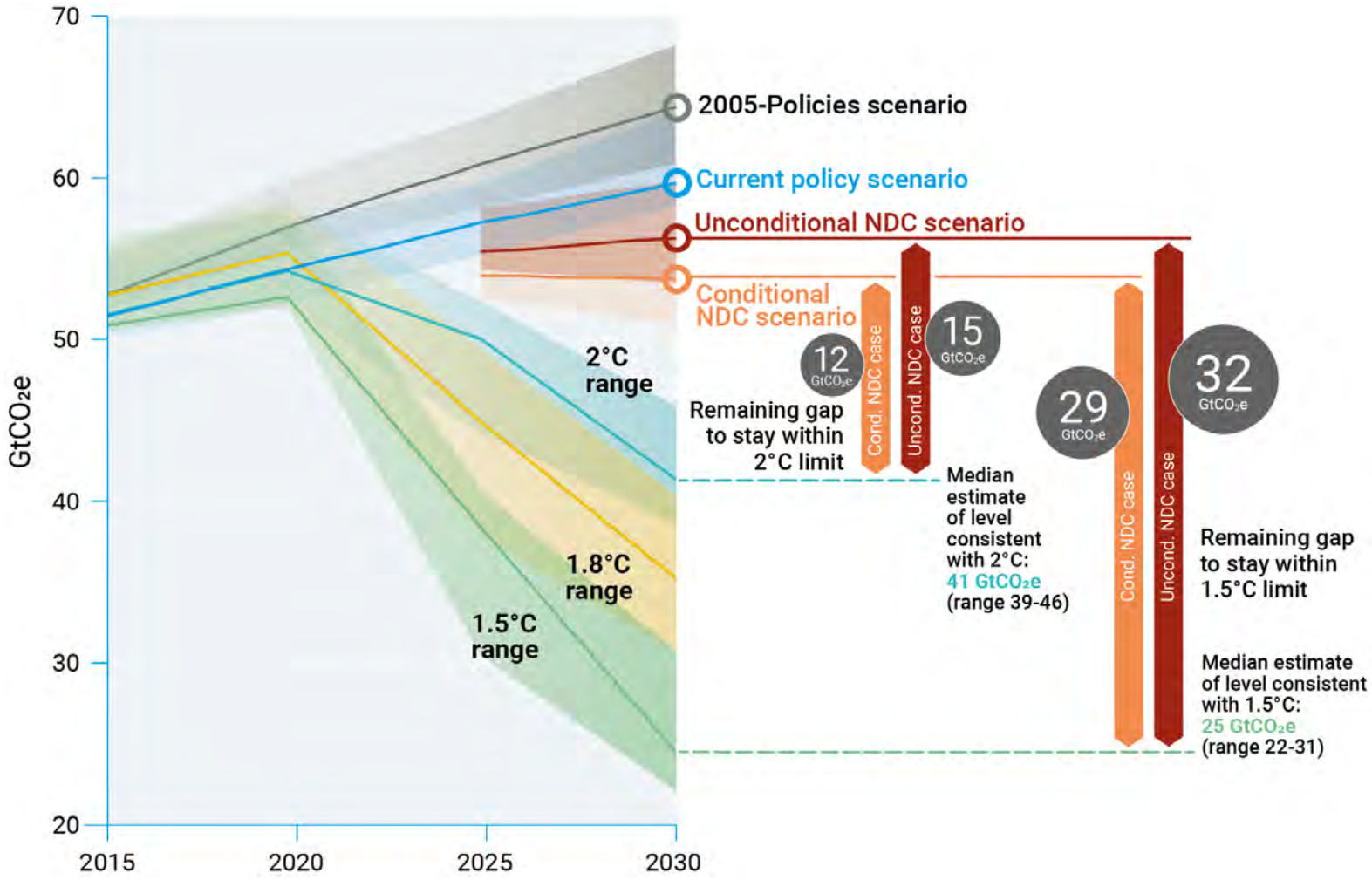
Unconditional NDC scenario
Global total emissions **56 $GtCO_2e$** (range: 54-60)

Conditional NDC scenario
Global total emissions **54 $GtCO_2e$** (range: 51-56)

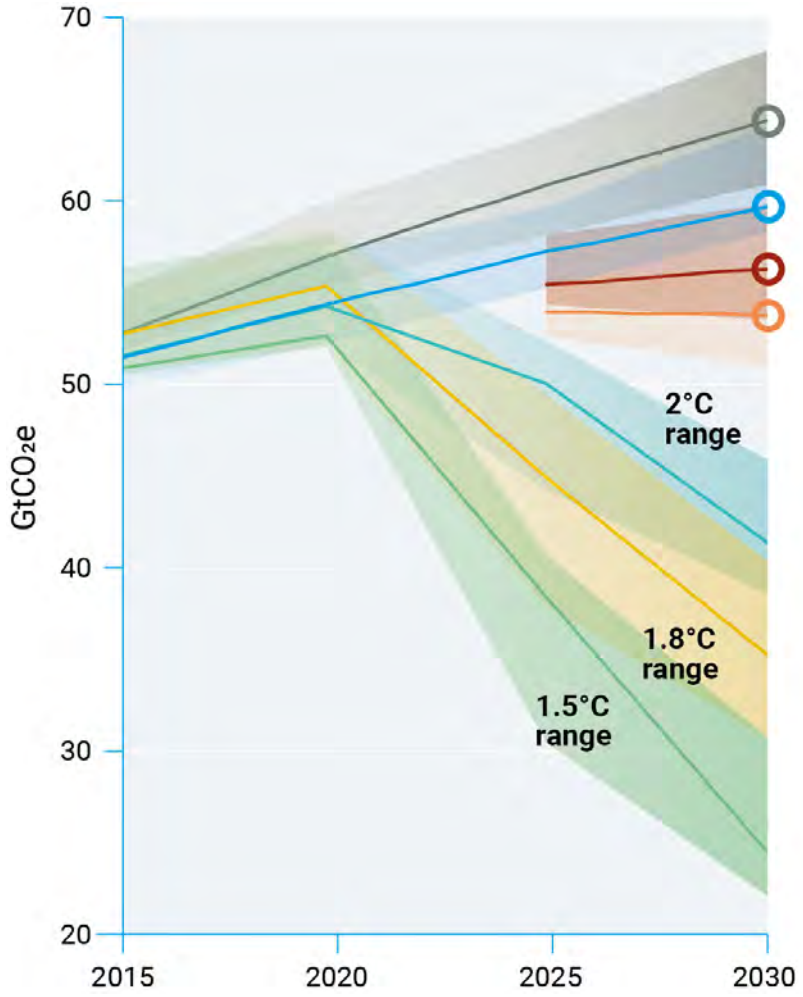
2°C pathways
Global total emissions **41 $GtCO_2e$** (range: 39-46)

1.5°C pathways
Global total emissions **25 $GtCO_2e$** (range: 22-31)

NDC contributions and the Emissions Gap



NDC contributions and the Emissions Gap



- **Full implementation of the unconditional NDCs is consistent with staying below 3.2°C by 2100. Additional implementation of conditional NDCs lowers this by about 0.2°C.**
- **Every year of postponed action means that deeper and faster cuts will be required, jeopardizing the achievement of the Paris Agreement goals.**
- **Bridging the emissions gap will require that countries increase their NDC ambitions threefold to limit warming to 2°C and more than fivefold for the 1.5°C goal.**

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The number of countries and states that are committing to zero emission targets is increasing, though it is still far from the scale and pace required and action is lacking in many areas

Target categories	G20 countries	Country level	Regional level
Zero emissions by year x	**2 G20** members (France, UK) have passed legislation **3 G20** members (EU and Germany and Italy as part of EU[1]) currently in process of passing legislation **15 G20** members have no binding (net-) zero-emission targets	71 countries	11 regions
Ambitious comprehensive CO_2 pricing in all sectors by year x [2]	**No G20** member has implemented ambitious comprehensive CO_2 pricing in all sectors, but 9 G20 members have implemented carbon pricing as ETS or carbon tax with partial coverage and/or lower CO_2 prices (as at August 2019)	No country ✖	No regions ✖
Phase out all fossil fuel subsidies by year x	**No G20** member has existing reform plans to fully phase out all fossil fuel subsidies, but the G20 took a decision in 2009 to gradually phase out fossil fuel subsides with an annual peer-review among G20 members	No country ✖	No regions ✖
Make all finance flows consistent with the Paris Agreement goals by year x *	**No G20** member has made all finance flows fully aligned with the Paris Agreement goals, but the UK has published a Green Finance Strategy in 2019 as an example of intermediate action	No country ✖	No regions ✖

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Global decarbonization requires fundamental structural changes, which should be designed to bring multiple co-benefits for humanity and planetary support systems

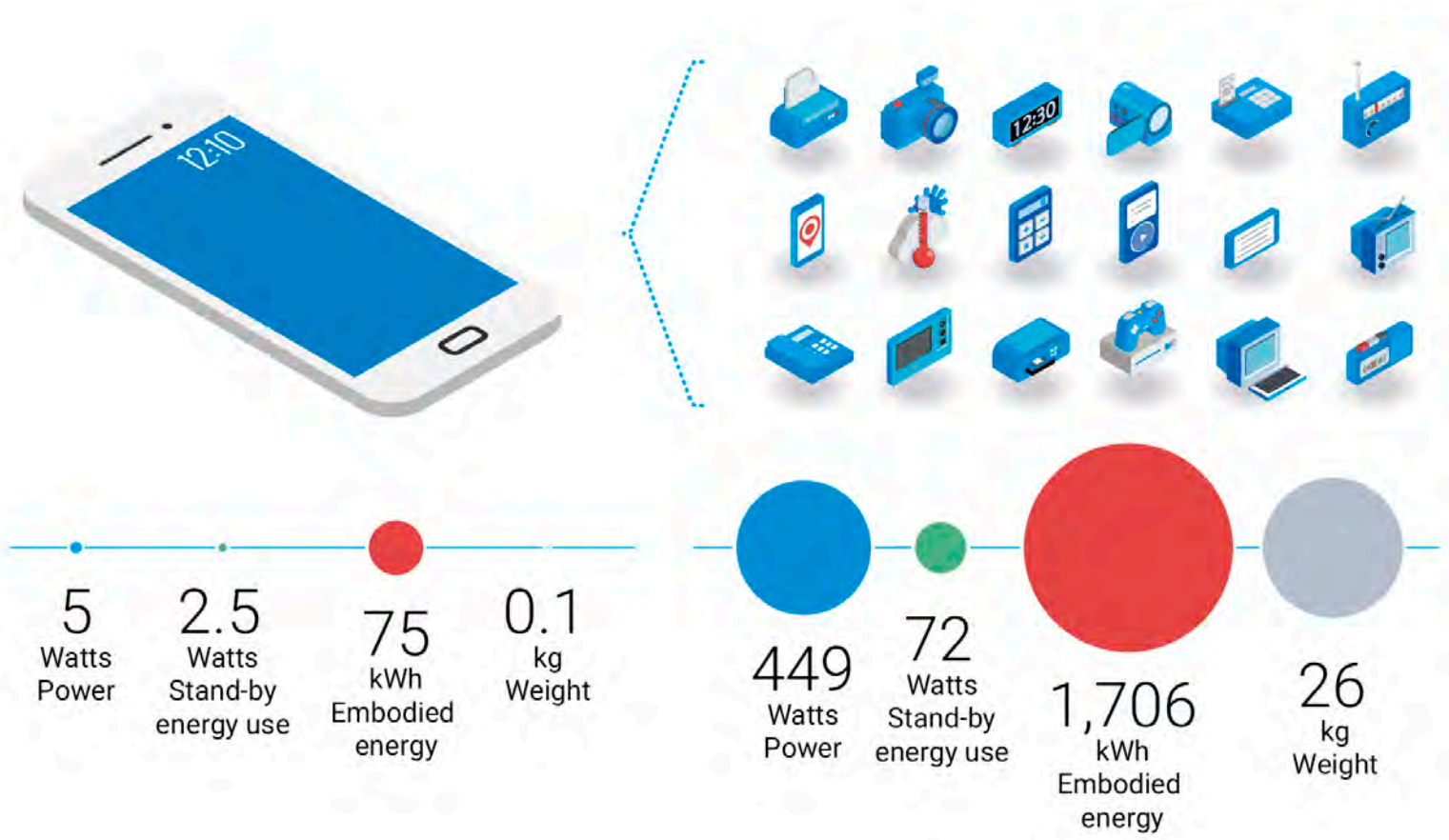
Climate protection and adaptation investments will become a precondition for peace and stability.

Unprecedented efforts are required to transform societies, economies, infrastructures and governance institutions

Six major transformations assessed:

- air pollution, air quality, health;
- urbanization;
- governance,
- education, employment;
- digitalization;
- energy- and material-efficient services for raising living standards;
- land use, food security, bioenergy.

Example of transformation in the IT sector over the last few decades and the energy and material benefits achieved



Source: Grubler *et al*. (2018), based on a visualization by Tupy (2012)

Options for transforming the global energy system

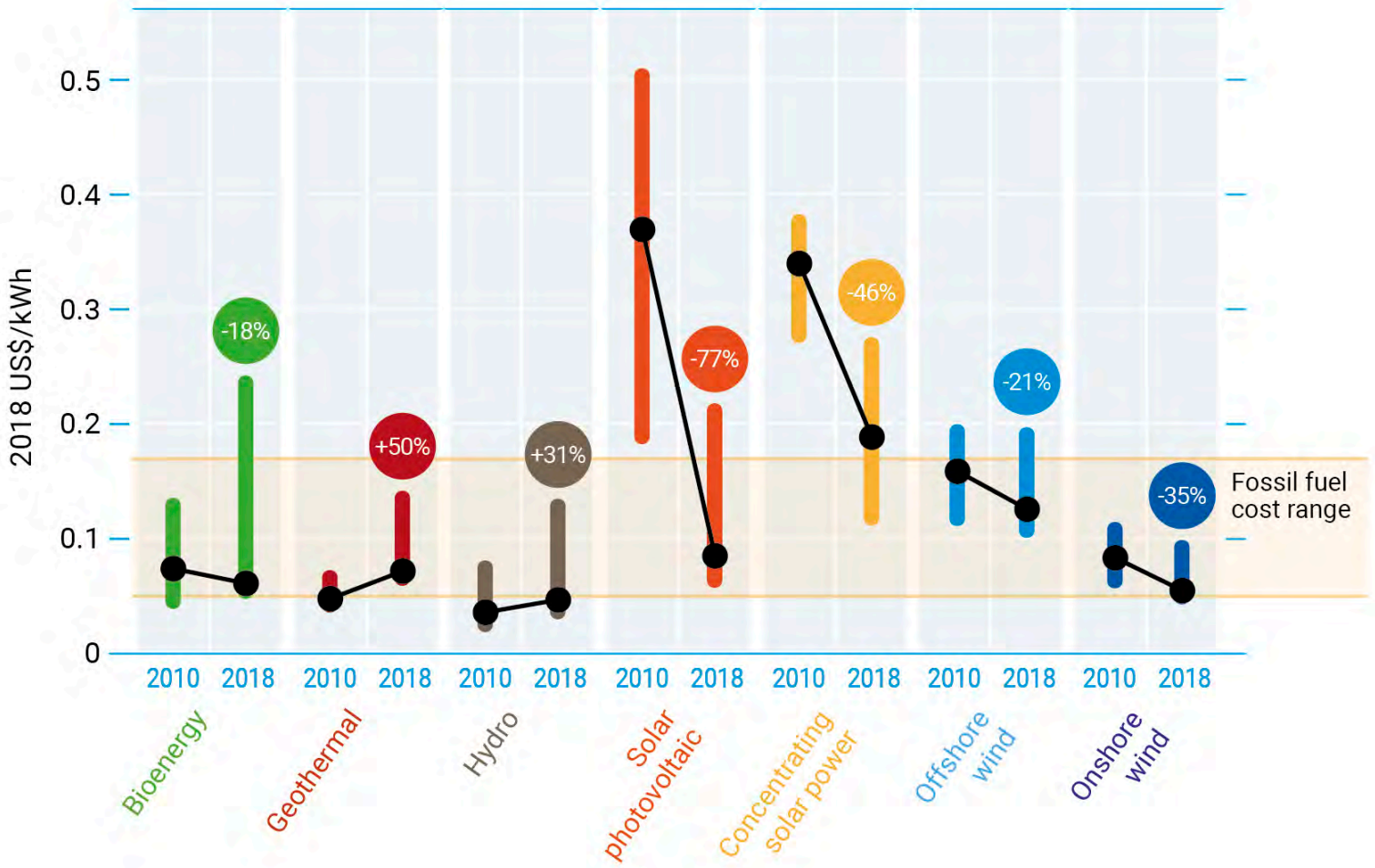
- Easy wins: expanding renewable energy for electrification

- Broad policy consensus: coal phase-out for rapid decarbonization of the energy system

- Large co-benefits: decarbonizing transport

- Hard to abate: decarbonizing energy-intensive industry
- Leapfrogging potential: avoiding future emissions and ensuring energy access

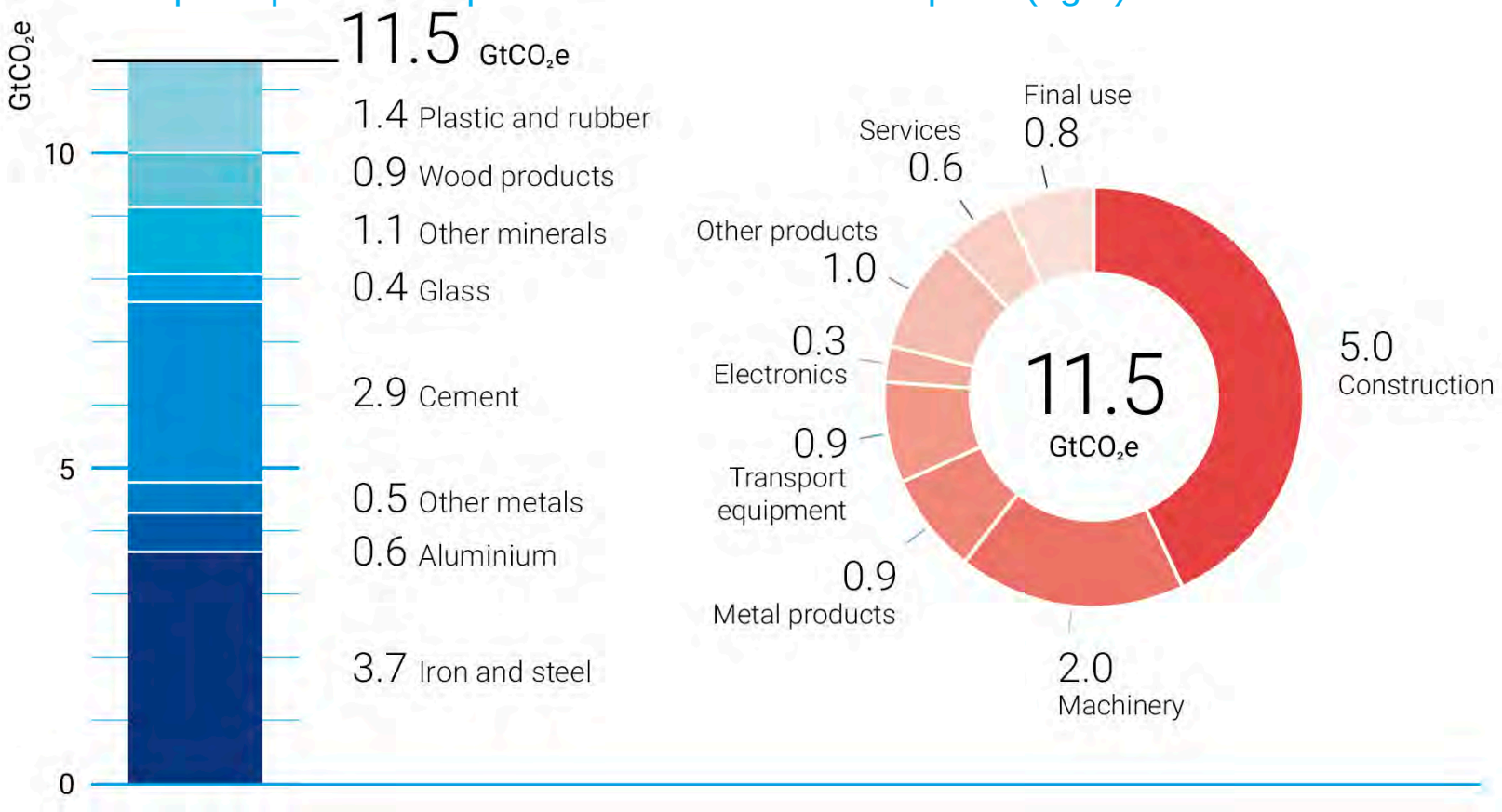
Global levelized cost of renewable energy continues to decrease and is competitive with fossil fuels



Source: Based on IRENA (2018)

Material production and consumption is associated with significant CO_2 emissions

GHG associated with materials production by material (left) and by the first use of materials in subsequent production processes or final consumption (right)



Note: The data excludes emissions from land-use change and credits for carbon storage.
Source: Based on Hertwich *et al*. (2019).

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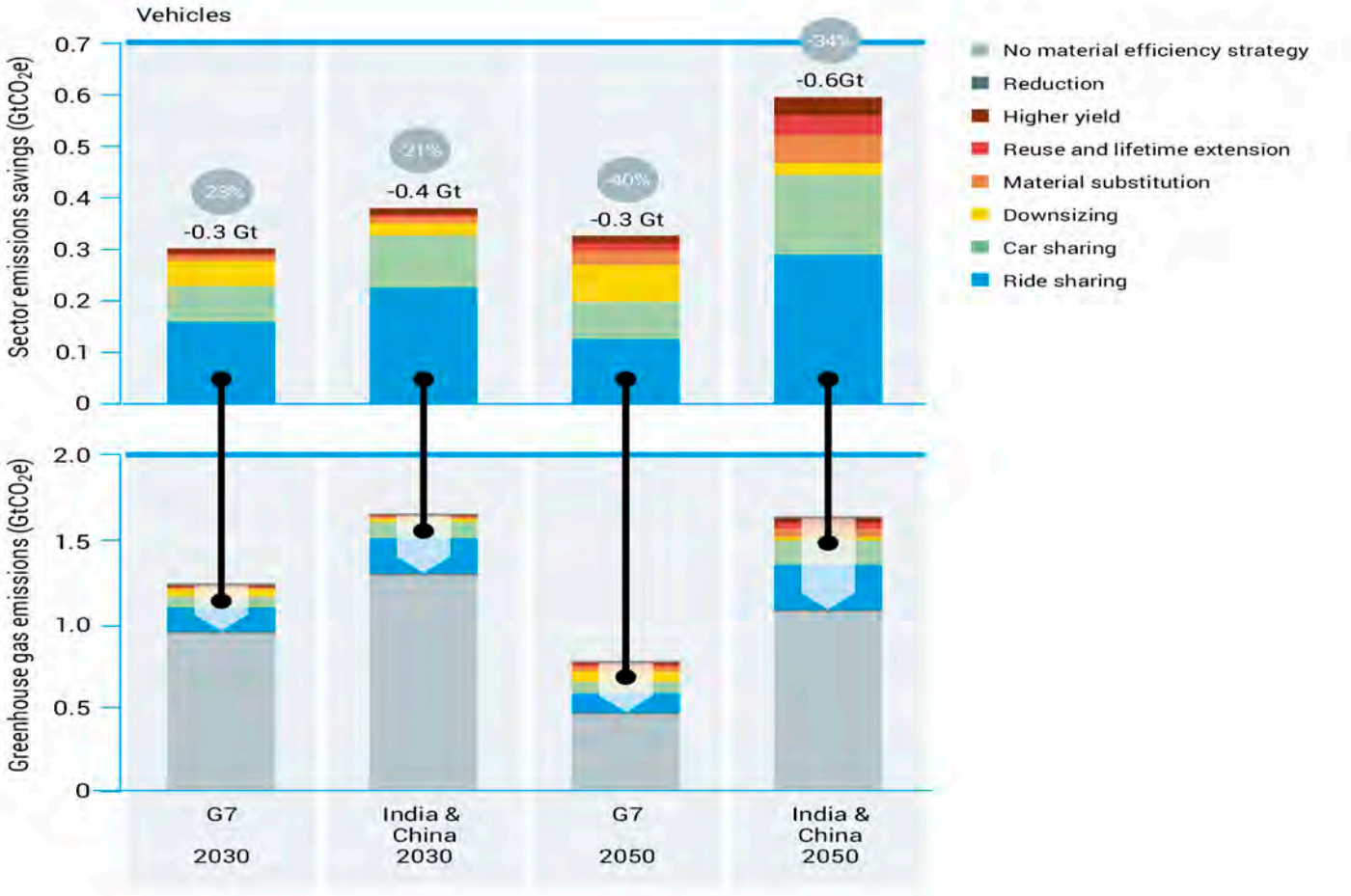
Material efficiency can bring significant emission reductions from the manufacturing and use of passenger vehicles

Annual emissions and potential reductions from the manufacturing and use of passenger vehicles in the G7 and in China and India



Note: The scenario follows the Shared Socioeconomic Pathway SSP1 to mitigate emissions to below 2°C

Source: International Resource Panel (*forthcoming*)

Emissions Gap Report 2019 - answers to the main questions

- **What is the trend in global GHG emissions?**
  - Global emissions continue to rise and show no signs of peaking
  - Collectively countries are on track to meet their Cancun pledges, but these are **not** sufficiently ambitious to establish a path that will get the world to 2030 emission levels consistent with the well below 2^{o}C and 1.5^{o}C goal
- **Are countries on track to meet their NDC targets?**
  - Collectively, G20 members are **not** on track to meet their 2030 NDC commitments.
  - Individually, six countries are on track, but seven countries are currently not on track, and for a further three, it is not possible to say
- **What will the NDCs contribute?**
  - Emission levels resulting from NDCs are 4 to 6 $GtCO_2e/yr$ lower than the current policy trajectory in 2030, but the remaining Gap is in the order of 12 to 15 $GtCO_2e/yr$ compared with 2^{o}C scenarios and 29 to 32 $GtCO_2e/yr$ compared with 1.5^{o}C

Emissions Gap Report 2019 - answers to the main questions

- **Will this be sufficient to stay well below 2°C and pursue 1.5°C?**
  - **No** - without enhanced ambition the likely global average temperature increase will be in the range of 3.0 - 3.2°C by the end of the century.
  - The carbon dioxide budget for the 2°C scenario will be close to depleted by 2030, and the 1.5°C budget exceeded by far
- **Can the 2030 Gap be bridged - and how?**
  - There are more opportunities and incentives for all countries to undertake ambitious climate action than ever before, providing a strong basis for enhancing NDC ambitions by 2020
  - Transformational change is required and must support sustainable development goals
  - Power systems will need to be decarbonised in the next few decades and much of transport electrified. Enhanced energy efficiency will be key to success.
  - Material efficiency can make important contributions

Inger Andersen,
UNEP Executive Director:

"Countries simply cannot wait until the end of 2020, when new climate commitments are due, to step up action.
They – and every city, region, business and individual – need to act now!"

Thank you

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