How much enhanced action for climate protection?

The emissions gap and how to bridge it

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Workshop on Enhancing Mitigation Ambition
Ad Hoc Working Group on the Durban Platform for Enhanced Action (ADP)

Bonn, Germany
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UNEP
United Nations Environment Programme

Moving forward on global climate policy

Copenhagen
December,
2009

Cancun
December,
2010

Durban
December,
2011

<u>Two developments</u> …

✓ **A target …**

Staying below an increase of 2 degrees Celsius (1.5^0 C)

✓ **A means to get there …**

Country pledges to control emissions (pegged to 2020)

<u>Two questions</u> …

✓ **Is there a gap between …**

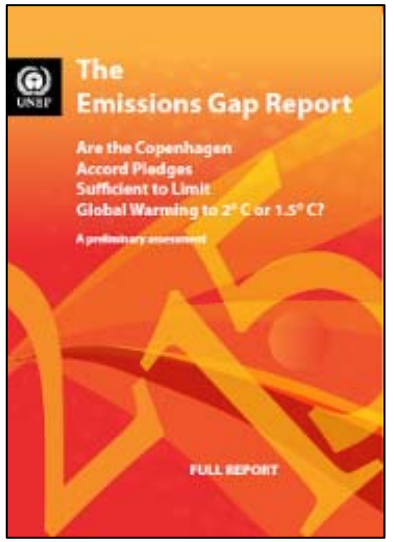
What we are aiming for … and where we are heading ?

✓ **How can the gap be *bridged*?**

The Emissions Gap ….

2010 Cancun Climate Summit
UNEP “Emissions Gap” report

United Nations Environment Programme with the European Climate Foundation & National Institute of Ecology, Mexico

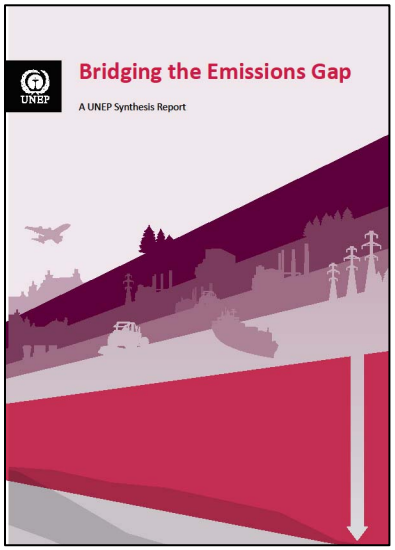


2011 Durban Climate Summit
UNEP “Bridging the Emissions Gap” report

United Nations Environment Programme with the European Climate Foundation & Ministry of Environment, South Africa

55 scientists, 28 institutions, 15 countries

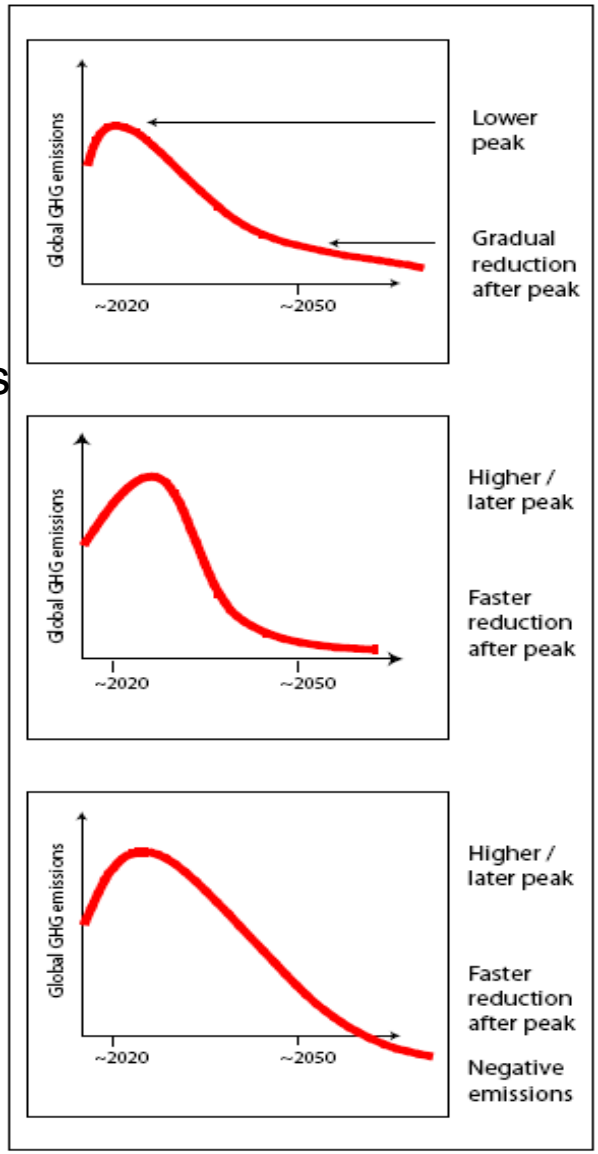
Complementing the analyses of IPCC and UNFCCC secretariat



What are we aiming for?
Complying with the 2°C target

1. Meeting a temperature target depends largely on *cumulative* emissions

2. Different pathways of emissions correspond to same cumulative emissions



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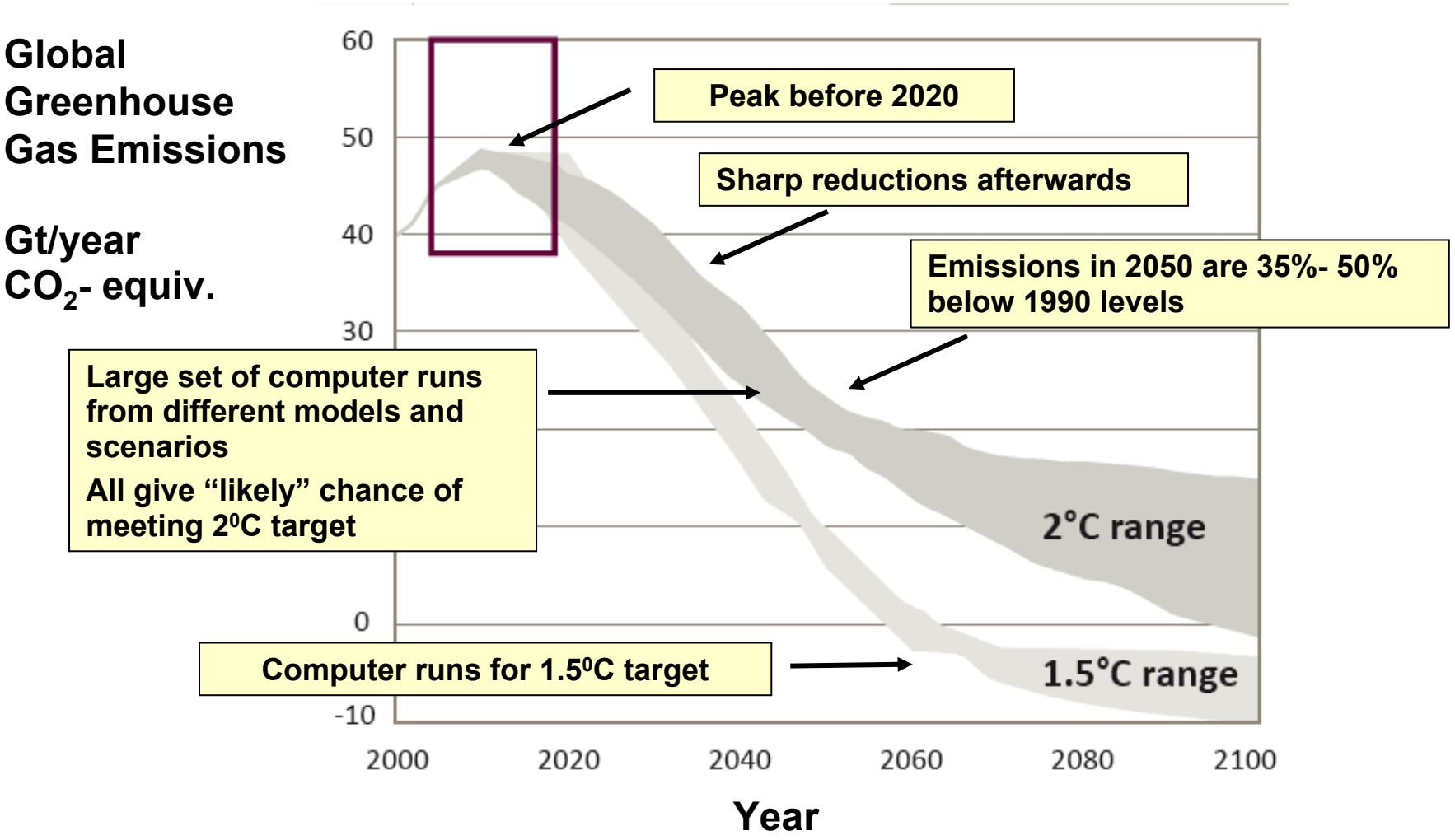
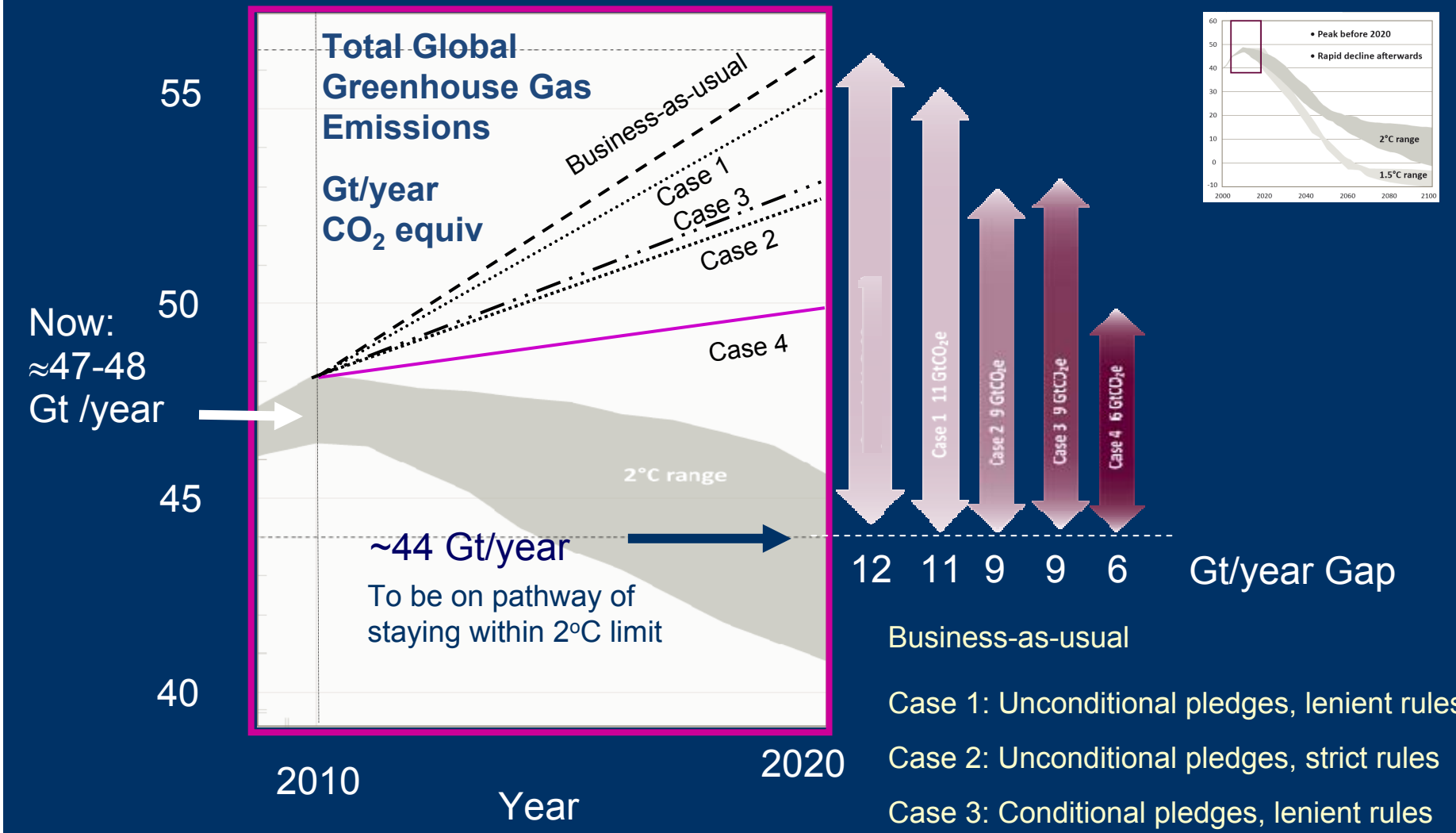


Where are we headed? How big is gap in 2020?



Business-as-usual

Case 1: Unconditional pledges, lenient rules

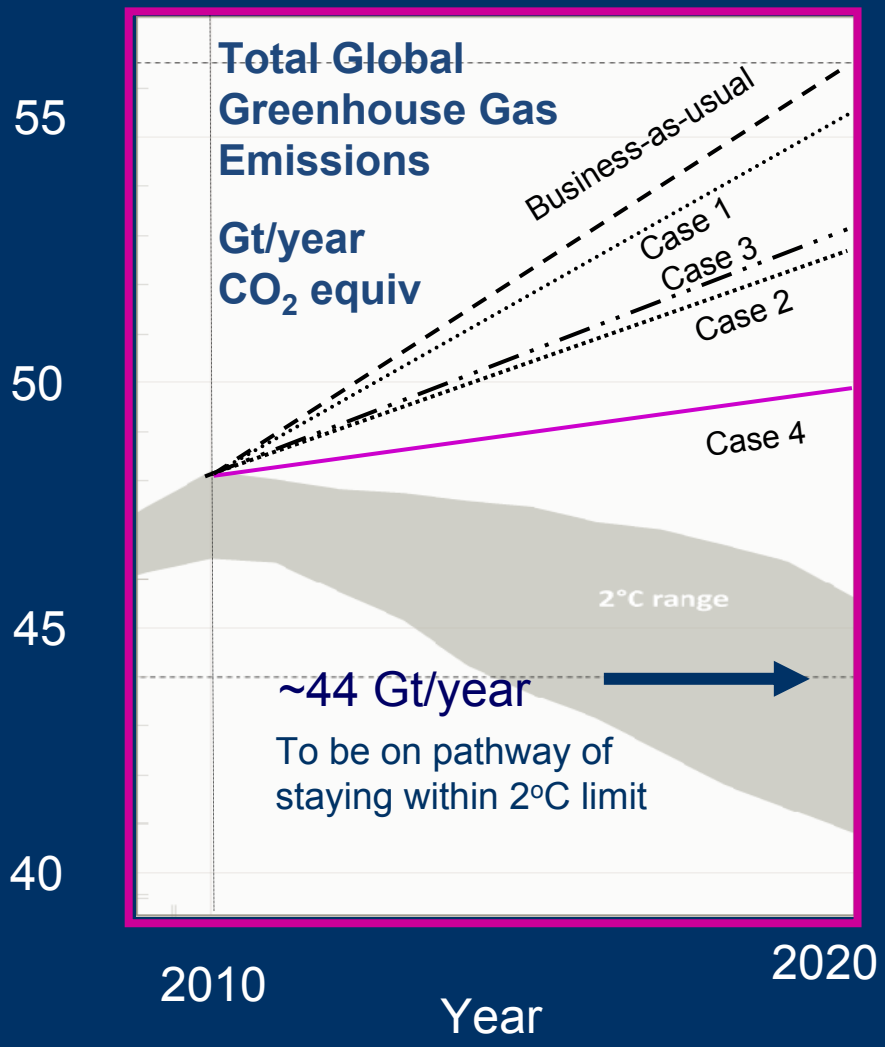
Case 2: Unconditional pledges, strict rules

Case 3: Conditional pledges, lenient rules

Case 4: Conditional pledges, strict rules

56, 55, 53,50

Where are we headed? How big is gap in 2020?



Under business-as-usual

Gap = 12 Gt/year CO_2-equiv

Under different cases of country pledges :

Gap = 6 – 11 Gt/year

Under most ambitious case Gap = 6 Gt/year:

Half way to 2° target; but not far enough …

What happens if the gap is not closed?

Best guess temperature increase:

$\approx$ + 2.5 to + 5.0^{0}C (up to 2100 relative to pre-industrial)

How can the 2020 gap be bridged?

Two ways of looking at the question 1st: Integrated Assessment Models

What scenarios meet the 2°C target and close the gap?

1. Improve energy efficiency decrease energy/GDP by ≈ 1 – 2 % per year (between 2005 & 2020)

2. Change to lower-emission energy mix
(percentage of total primary energy in 2020)

- Non-fossil fuels up to 28% (now 18.5%)
- Biomass = up to 17% (now 10.5%)

- Other renewables = up to 9% (now 2.5%)

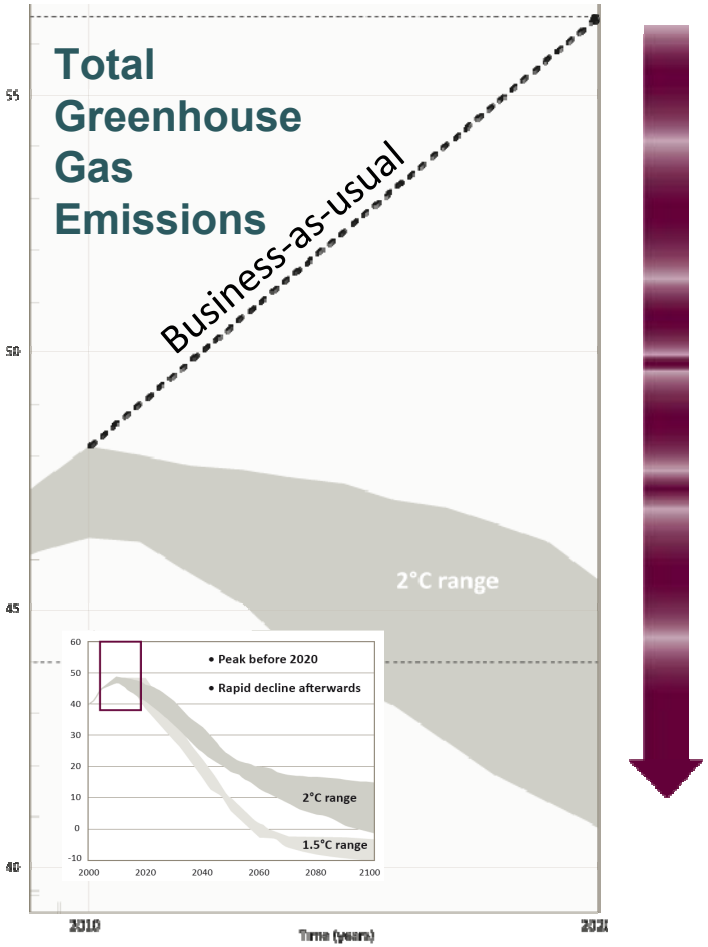
3. Reduce non-CO_2 emissions: up to - 19% (Co-benefits)
(relative to 2020 business-as-usual)

Each group/scenario had a different combination.
Average marginal cost ≈ up to 38 USD/ton equiv CO_2 reduced
No breakthroughs needed to bridge the gap.

How can the 2020 gap be bridged?

Two ways of looking at the problem: 2nd: Bottom-up sectoral studies

What is the emission reduction potential in each sector?



2010 Year 2020

How can the 2020 gap be bridged?

Two ways of looking at the problem: 2nd: Bottom-up sectoral studies

What is the emission reduction potential in each sector?

- Power
- Industry
- Transport
- Aviation & Shipping
- Buildings

- Energy conservation
- Renewable energy
- Fuel switching
- Design & planning (building, land use, transportation)

How can the 2020 gap be bridged?

Two ways of looking at the problem: 2nd: Bottom-up sectoral studies

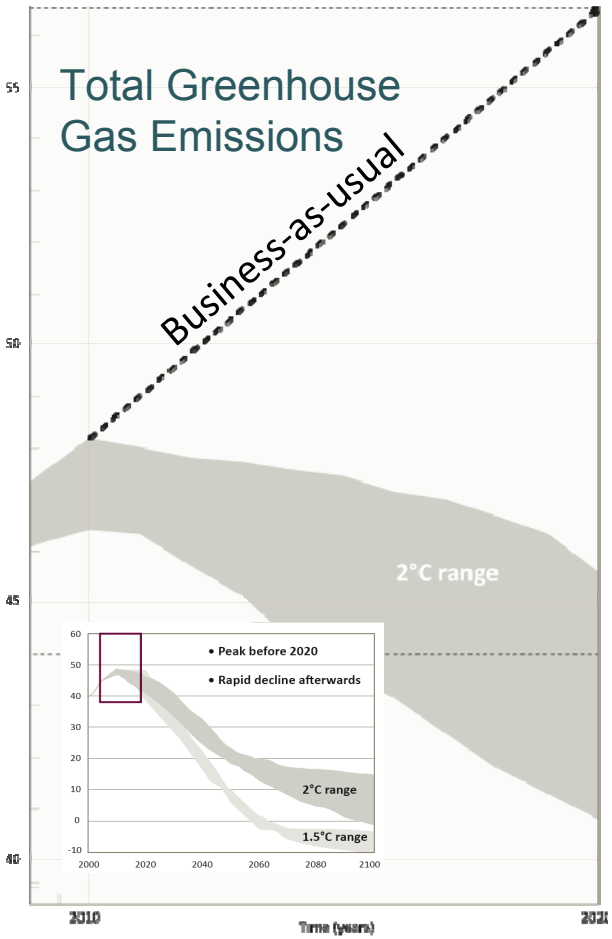
What is the emission reduction potential in each sector?

- Forestry
- Agriculture
- Waste

- Sustainable forest management
- Sustainable agriculture (nutrient & soil management)
- Land use planning; avoided deforestation
- Biogas recovery

How can the 2020 gap be bridged?

Two ways of looking at the problem: 2nd: Bottom-up sectoral studies



2010 Year 2020

Emission reduction potential in 2020 (Gt/year equivalent CO_2)

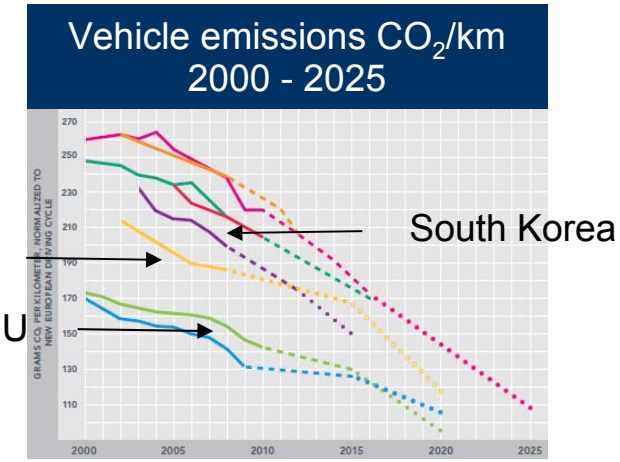
Power	2.2 – 3.9
Industry	1.5 – 4.6
Transport	1.4 – 2.0
Aviation & Shipping	0.3 – 0.5
Buildings	1.4 – 2.9
Waste	≈ 0.8
Forestry	1.3 – 4.2
Agriculture	1.1 – 4.3

Total Emission Reduction Potential = 17 ± 3 Gt/year CO_2e

The Gap in 2020 = 12 Gt/year CO_2e
(relative to business-as-usual)

Potential in sectors big enough to bridge the gap.

And the potential is already being realized
… Major actions to reduce greenhouse gas emissions

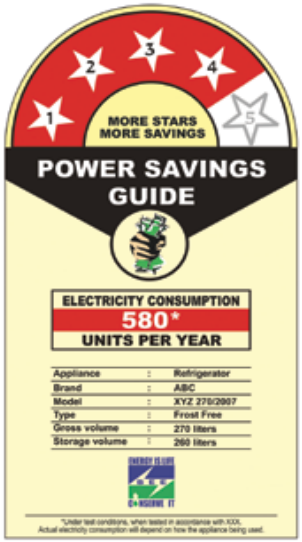


Vehicle emission standards – China, EU, Japan, S.Korea, US, …

Reduction of vehicle CO_2 emissions from Germany: - 10% / year (1978 - 2005)

Bus Rapid Transit (BRT) – Colombia, China, Mexico, South Korea. Reduction of CO_2 equivalent emissions from Colombia: 1 Mt/yr relative to baseline

And the potential is already being realized
… Major actions to reduce greenhouse gas emissions



Energy appliance label, India

Energy appliance label, US EPA

Energy labeling and standards of appliances - India, China, Mexico, EU, US, … total of 78 countries

Avoided CO_2 emissions in Mexico due to energy savings related to standards on 4 appliance types (cumulative 1995-2005): 41 Mt

Avoided CO_2 emissions in China due to energy savings related to appliance standards (cumulative 2000-2005): 50 Mt

The urgency of acting …

Losing opportunities …

"Lock in" of high emission technologies, structures and processes

- Currently produced energy-inefficient vehicles will still be on the road in 2020
- Energy-wasteful buildings now under construction will last 100 years
- Becoming dependent on new cropland requiring high energy and fertilizer inputs
- Power plants are being constructed with fuel efficiency below what is technically feasible, and will have lifetime of >25 years

Summing up

To meet the two degree target

- Global emissions peak before 2020
- Global emissions in 2050 ≈ 1/3-1/2 below 1990
- Global emissions in 2020 ≈ 44 Gt/yr (41-46)

But the Emissions Gap in 2020
(between emissions consistent with 2°C target and emissions expected due to pledges)
is big → 6 -11 Gt CO_2e (= 12 under business-as-usual)

- Pledges not enough, countries have to work harder to stay within 2°C
- Much has to be done by 2020 to comply with the temperature target

Summing up

The Gap can be narrowed … with action in the negotiations

- Minimizing use of surplus emission credits & LULUCF credits
- Avoiding double-counting of offsets
- Pursuing more ambitious ("conditional") pledges

The Gap can be bridged … by realizing large potential in each sector

- Intervening in energy system → improvements in energy efficiency & accelerating the introduction of renewable energy;
- More sustainable management of wastes, agriculture and forests;
- Reducing CO_2 and non-CO_2 emissions;
- By implementing measures that are technically feasible and economic

It can be done, but there's no time to wait …