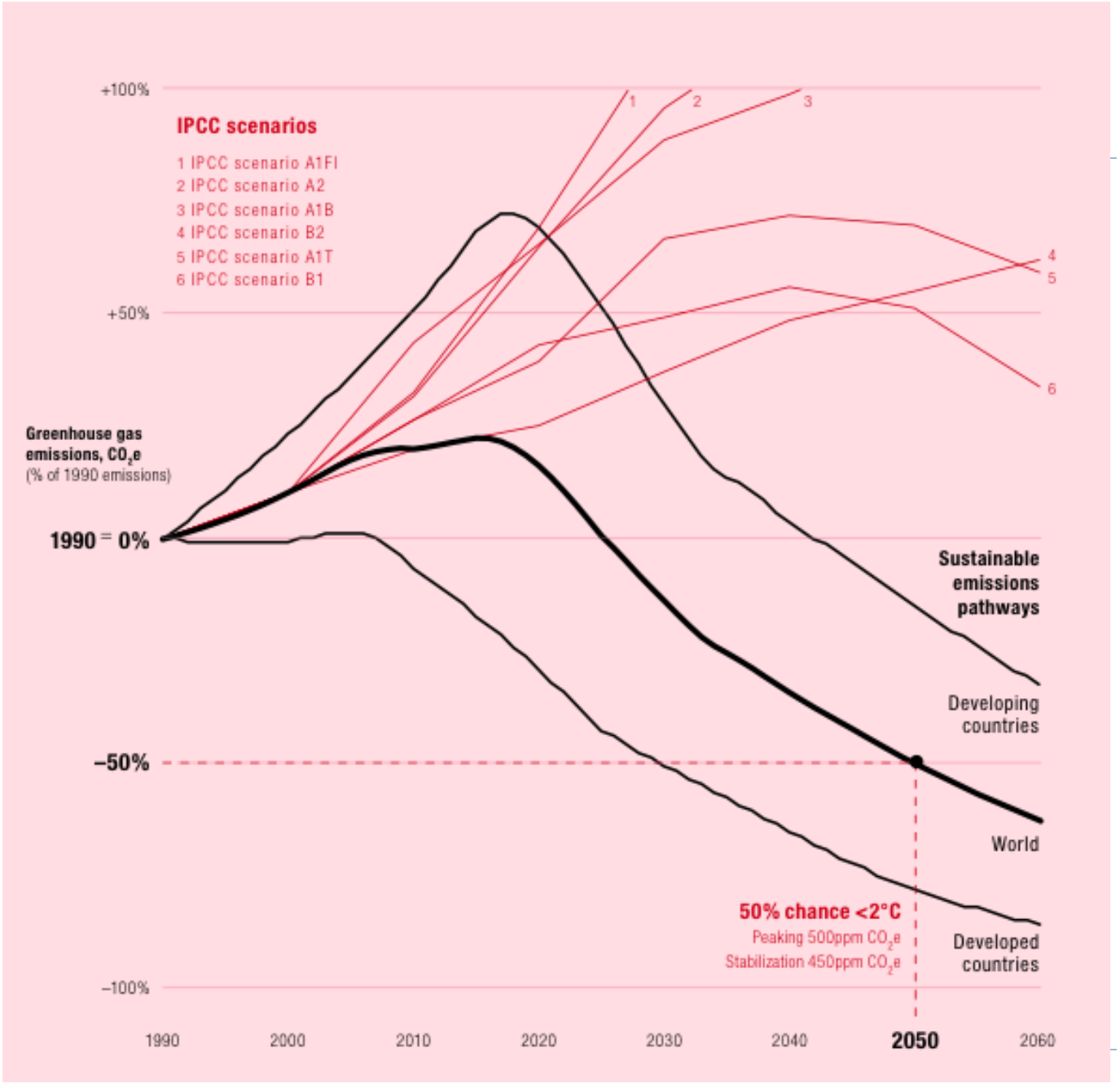
Geography of greenhouse gas emissions

Session 2

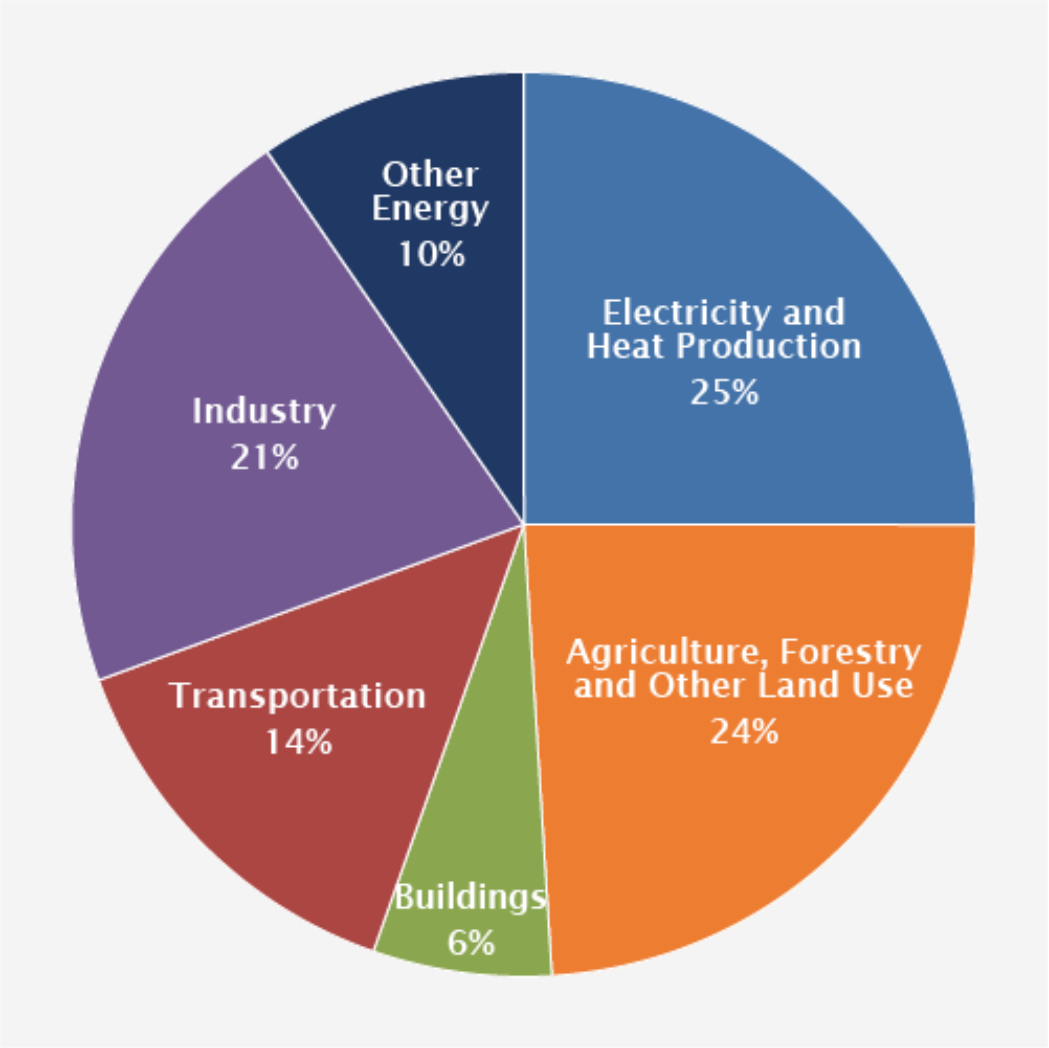
Introduction:
A continuous rise in emissions

- Over the last century, the average temperature on Earth has risen of about 0.7 – 0.8 ° C.
- This rise is the direct result of the increase in GHG concentrations since pre-industrial times.
- Until 1750, this concentration used to be constant, at 280 ppm. It is now over 400 ppm.
- The limit for a temperature rise of 2° C is 450 ppm.

- The annual rate of increase is about 2-3%.


+100%
IPCC scenarios
1 IPCC scenario A1FI
2 IPCC scenario A2
3 IPCC scenario A1B
4 IPCC scenario B2
5 IPCC scenario A1T
6 IPCC scenario B1
1
2
3
4
5
6
+50%
Greenhouse gas emissions, CO_2e
(% of 1990 emissions)
1990 = 0%
Sustainable emissions pathways
Developing countries
–50%
World
50% chance <2°C
Peaking 500ppm CO_2e
Stabilization 450ppm CO_2e
Developed countries
–100%
1990
2000
2010
2020
2030
2040
2050
2060

Where do emissions come from?

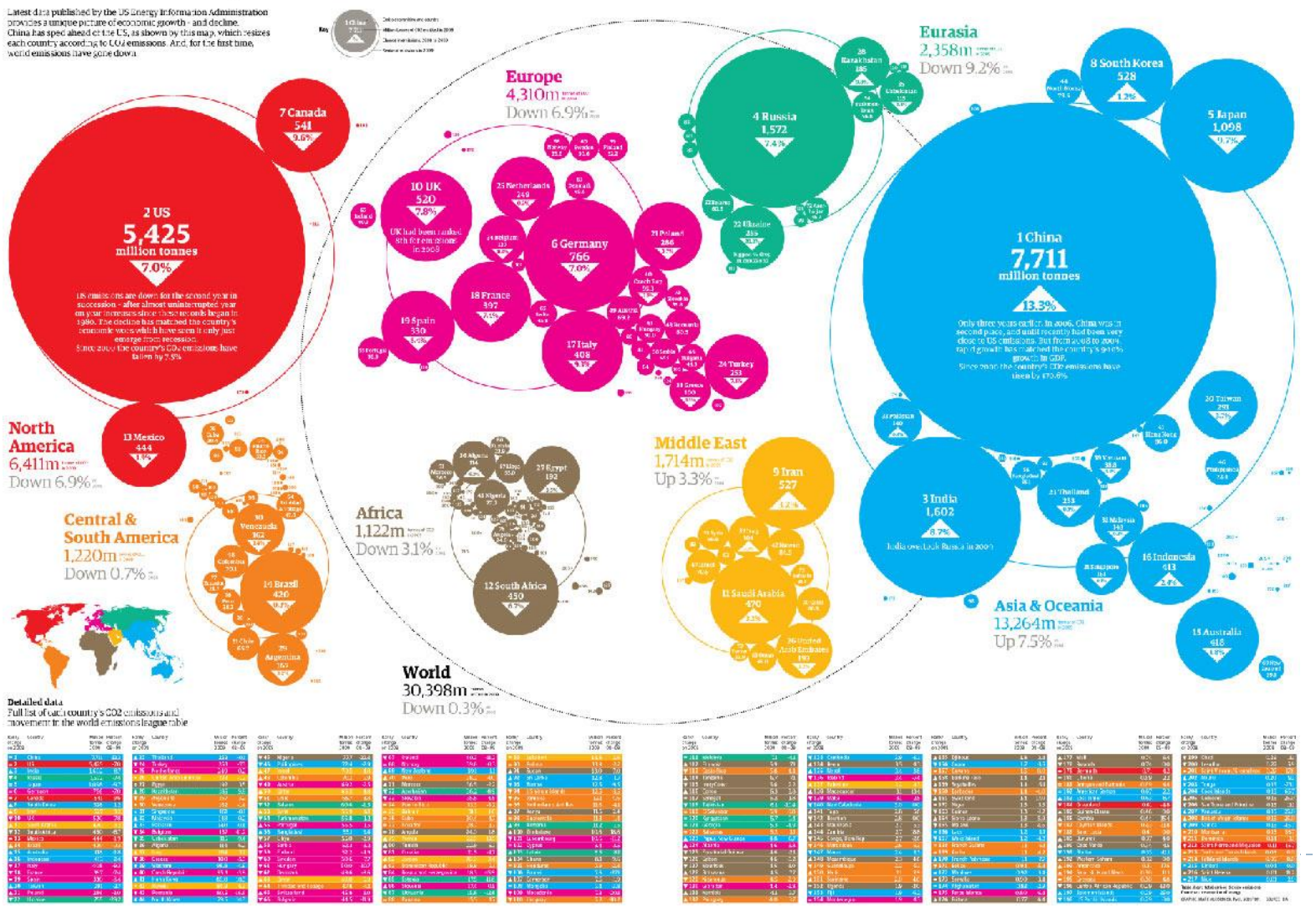


Source: IPCC 2014

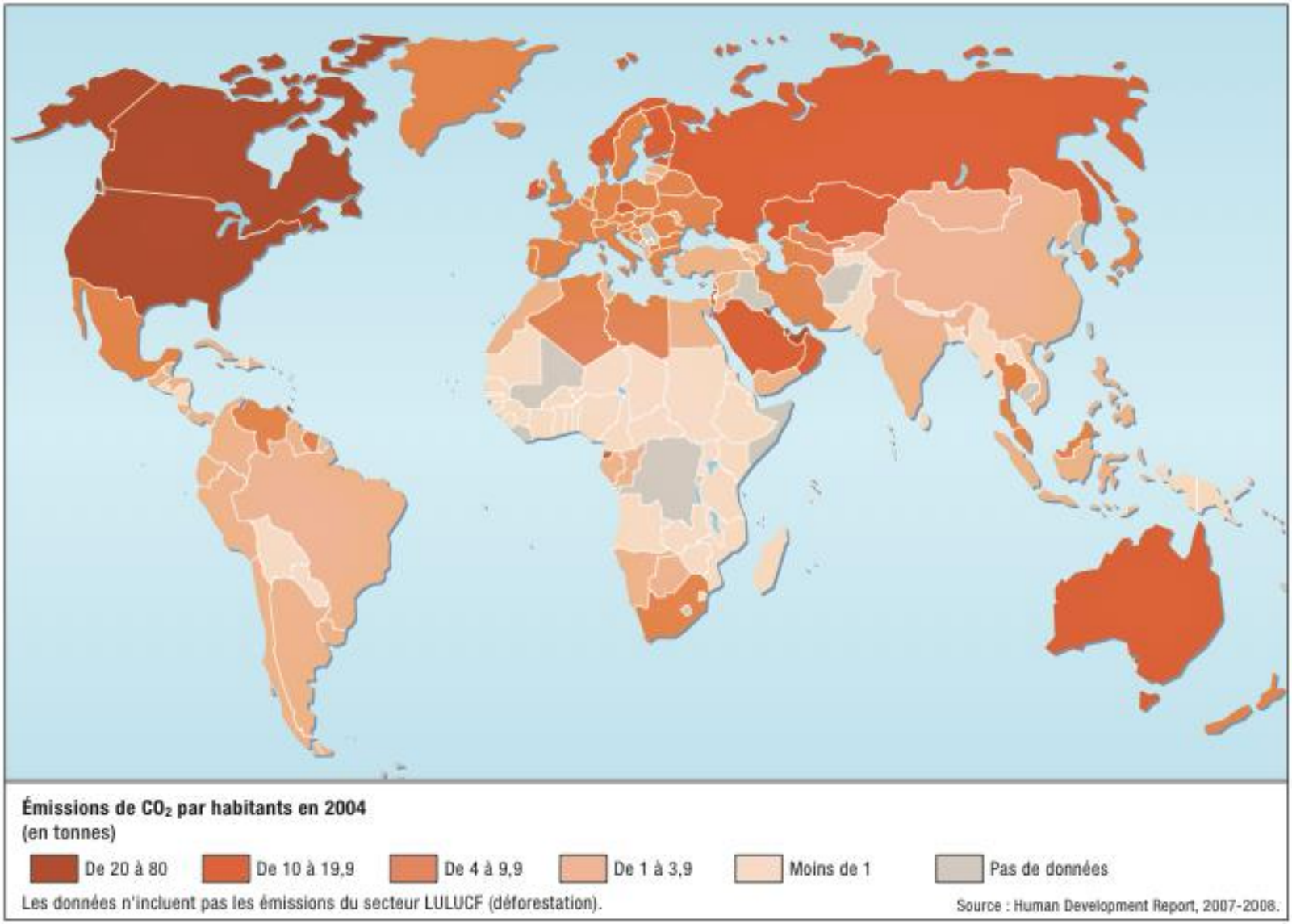
Why do some countries pollute more than others?

- GHG emissions have always been linked to economic growth.
  - *Dilemma: development or climate?*
- Demography
  - *In 2050, only 12% of the world's population will be in OECD countries.*
  - *But one billion people emit 70% of the world's emissions*
- Geography
  - *Local climate*
  - *Distance between main cities*
  - *Availability of natural resources*
- Public policies
  - *Energy policy*
  - *Carbon tax*
- Historical events

Different measures of emissions:
Per country



Per capita


Émissions de CO_2 par habitants en 2004
(en tonnes)
De 20 à 80
De 10 à 19,9
De 4 à 9,9
De 1 à 3,9
Moins de 1
Pas de données
Les données n'incluent pas les émissions du secteur LULUCF (déforestation).
Source : Human Development Report, 2007-2008.

Other possible approaches

- Energy intensity
  - A measure of emissions linked to GDP, and compatible with development.
  - How much does an economy pollute to produce an additional unit of wealth?
- Emissions on a given year or cumulative emissions? Since when? Historical responsibility.
- Emissions from LULUCF?

- **Different measures of emissions lead to different definitions of responsibility.**
- **Importance of MRV**