European Commission

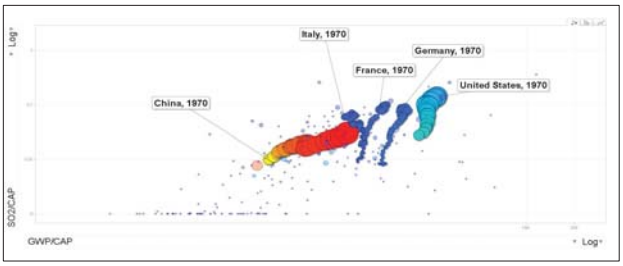
EDGAR EMISSION DATABASE FOR GLOBAL ATMOSPHERIC RESEARCH

http://edgar.jrc.ec.europa.eu

EDGAR AIR POLLUTANT EMISSIONS

RATIONALE

Ever growing economy takes high toll on the environment. *Can technological air pollution abatement measures cope with the necessary reduction of air pollutant emissions, or will a change in lifestyle also be needed to avoid detrimental degradation?*



A Kuznets analysis testing whether the wishful scenario that environmental degradation starts to reduce with increasing wealth can be observed in the case of SO2 emissions, but not for all countries.

EDGAR AIR POLLUTION RESULTS

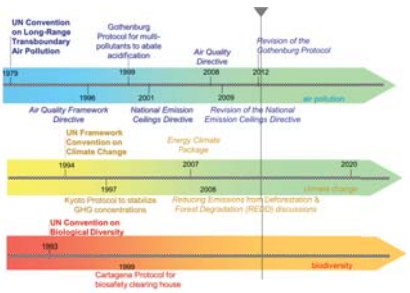
The EDGARv4.2 inventory of man-made emissions covers, in addition to the Kyoto Protocol greenhouse gases, the air pollutants: CO, NO_x, NMVOC, SO_2 and NH_3 for the time period from 1970 to 2008. In 2008, the top five global emitters for each of these substances were (in million tonnes):

CO		NMVOC		NO_2		NH_3		SO_2	
China	106	China	22	China	21	China	11	China	40
Central African Republic	105	USA	13	USA	14	India	4	USA	9
Sudan	61	India	11	Int. shipping	14	USA	4	India	9
India	58	Russia	7	India	7	Brazil	3	Int. shipping	8
The Demeocratic Republic of Congo	53	Central African Republic	6	Russia	4	Indonesia	2	Russia	6

Mercury (Hg^0, Hg^{2+}, Hg-P) is included in EDGARv4.tox1, thereby enriching the spectrum of multi-pollutant sources in the database.

INTERNATIONAL FRAMEWORK

Today, air quality is regulated by the UN Convention on **L**ong-**R**ange **T**ransboundary **A**ir **P**ollution (LRTAP) for all UNECE countries, covering Europe and North America, and is elaborated in a number of Protocols with national emission targets.



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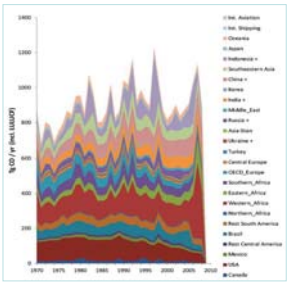
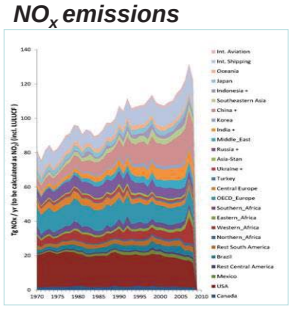
GLOBAL EMISSION TRENDS[1] (e.g.)

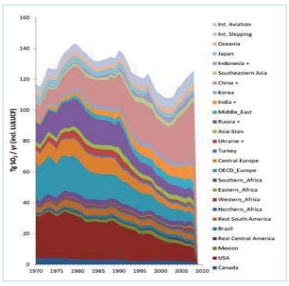
CO emissions



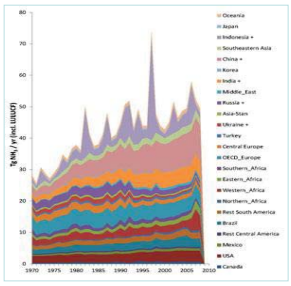
NO_x emissions



SO_2 emissions



NH_3 emissions

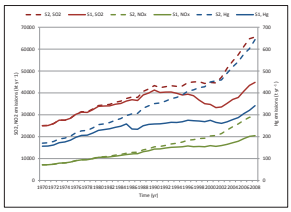


[1]*including large-scale biomass burning from the land use change and forestry (LULUCF) sector.*

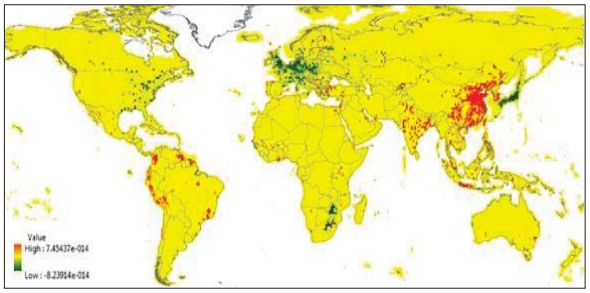
MITIGATION OF EMISSIONS

Emissions of SO_2, NO_x and Hg in power generation coal combustion, for two S1 and S2 scenarios.

Curves start bifurcating beginning 1990s
S1 - the baseline scenario, which considers existing emission reductions by End-of-Pipe measures allocated to each power plant type.
S2 - an ex-post mitigation assessment scenario, which assumes that no End-of-Pipe measures have been implemented.



The difference between total mercury emissions in 2008 and 1970 aggregated to 1° x1° resolution [kg/m²/s].



Reference: Muntean et al. (2014) "Trend analysis from 1970 to 2008 and model evaluation of EDGARv4 global gridded anthropogenic mercury emissions". http://edgar.jrc.ec.europa.eu/edgar_v4tox1/index.php

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