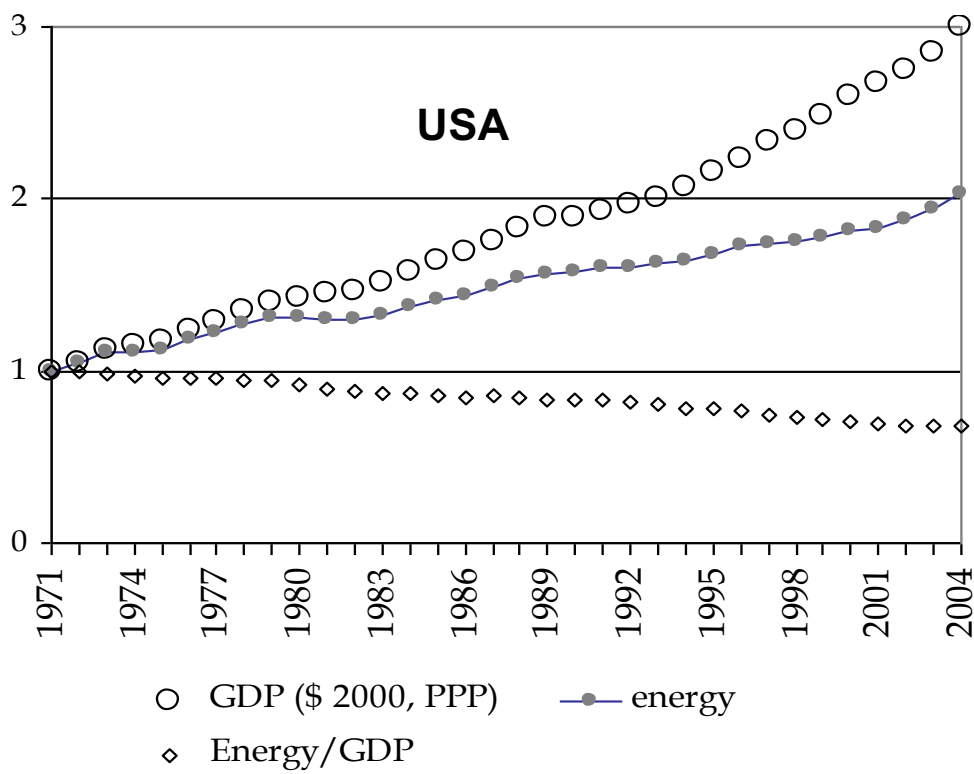
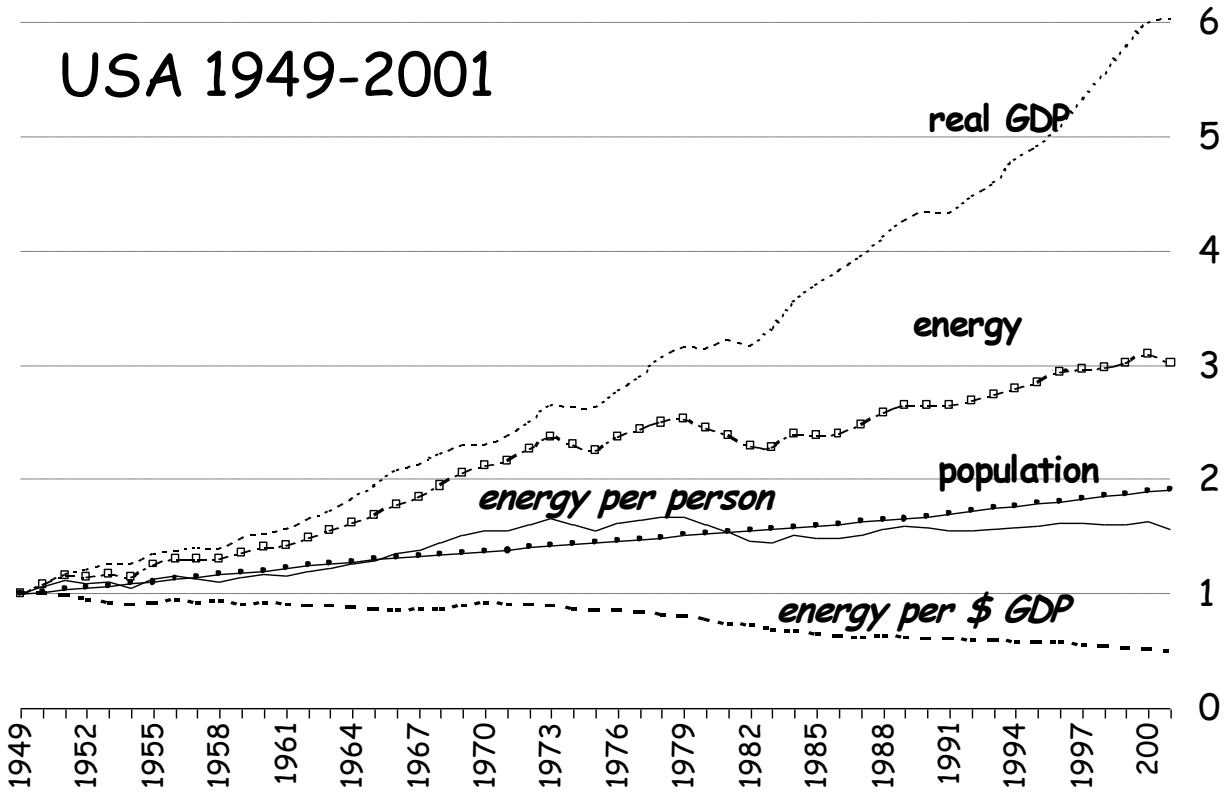


Verso la dematerializzazione?



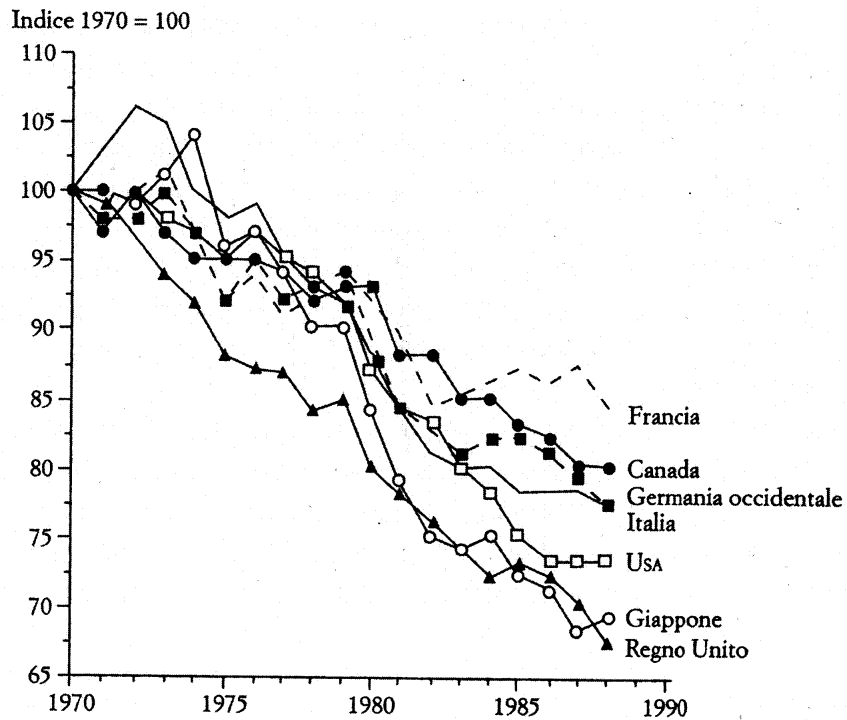
Energy/GDP = Energy intensity
Quantà energia per unità di GDP???

USA 1949-2001

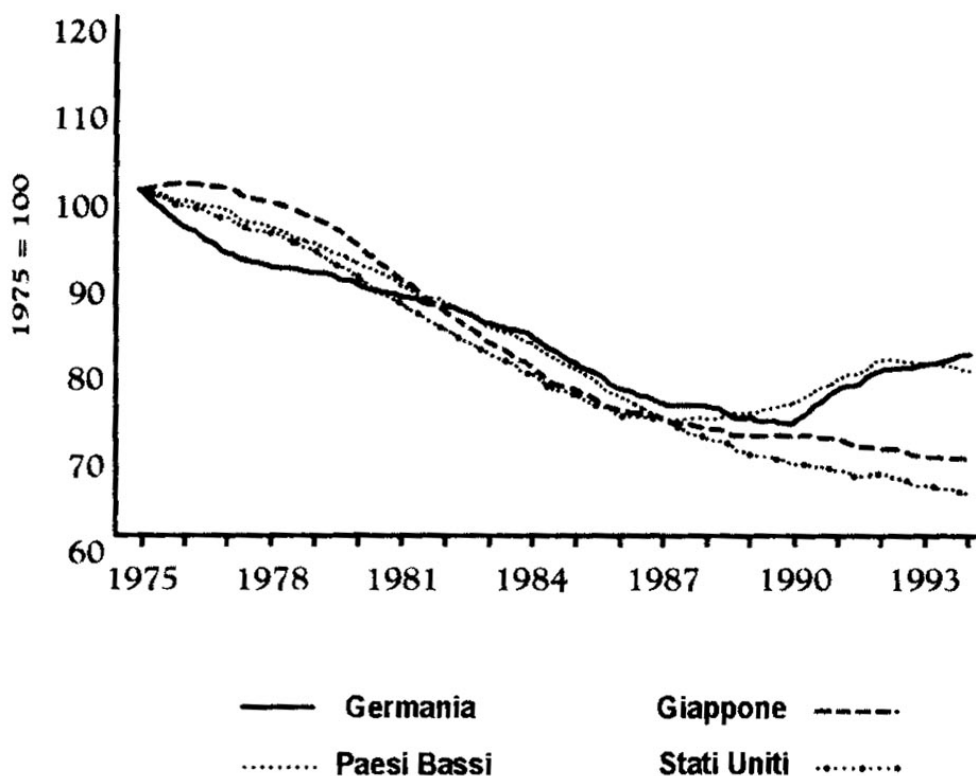


DATI: EIA (Energy Information Administration)
<http://www.eia.doe.gov/>

Intensità energetica per PIL



INDICE DI INTENSITÀ MATERIALE COMPLESSIVA (TMR/PIL)



Does Energy Efficiency Save Energy:
The Implications of accepting the Khazzoom-
Brookes Postulate.

Draft 3. April 1998

by Horace Herring, EERU, the Open
University

Herring H. 1999, "Does energy efficiency save energy? The debate
and its consequences" *Applied Energy*, 63 (3), 209-226

Dal topo all'elefante

KLEIBER'S CURVE (1932)

Tasso di metabolismo basale $\Delta E/\Delta t = k M^{\frac{3}{4}}$

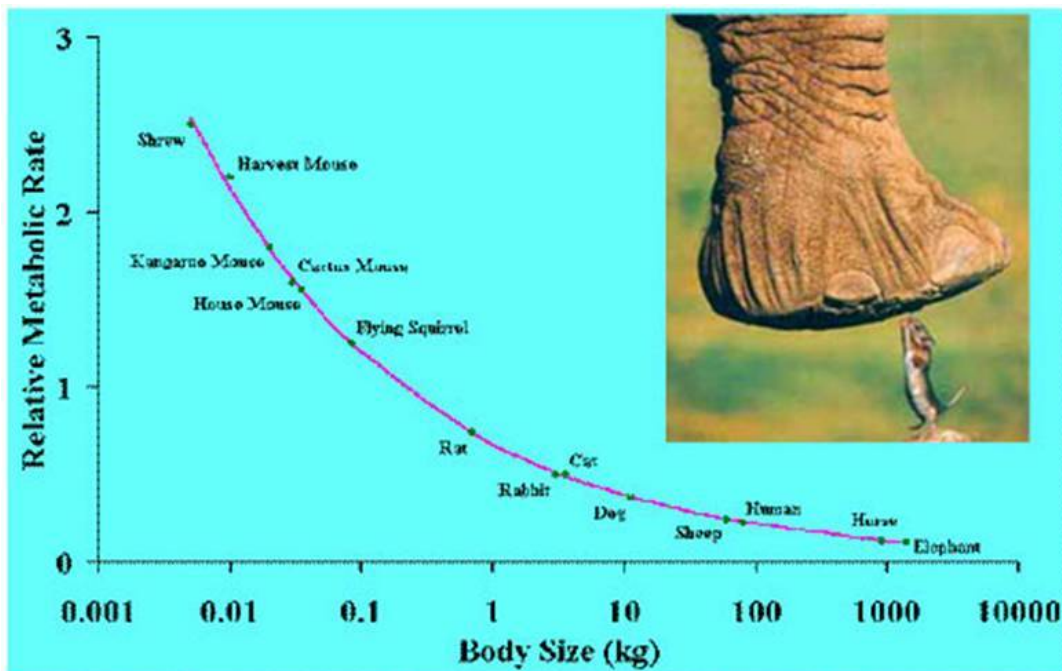
E=energia M =massa

Relazione più o meno vera su 18 ordini di grandezza quanto a valori delle masse dai microbi alle balene (v. ad esempio Blaxter 1989, Kleiber 1975, Miller 1986)

In termini assoluti: animali grandi richiedono più energia

In termini relativi: animali grandi richiedono meno energia per unità di massa

Il dal topo all'elefante



www.bio.georgiasouthern.edu/bio-home/harvey/dcom.html

Riferimenti bibliografici

Bioenergetica:

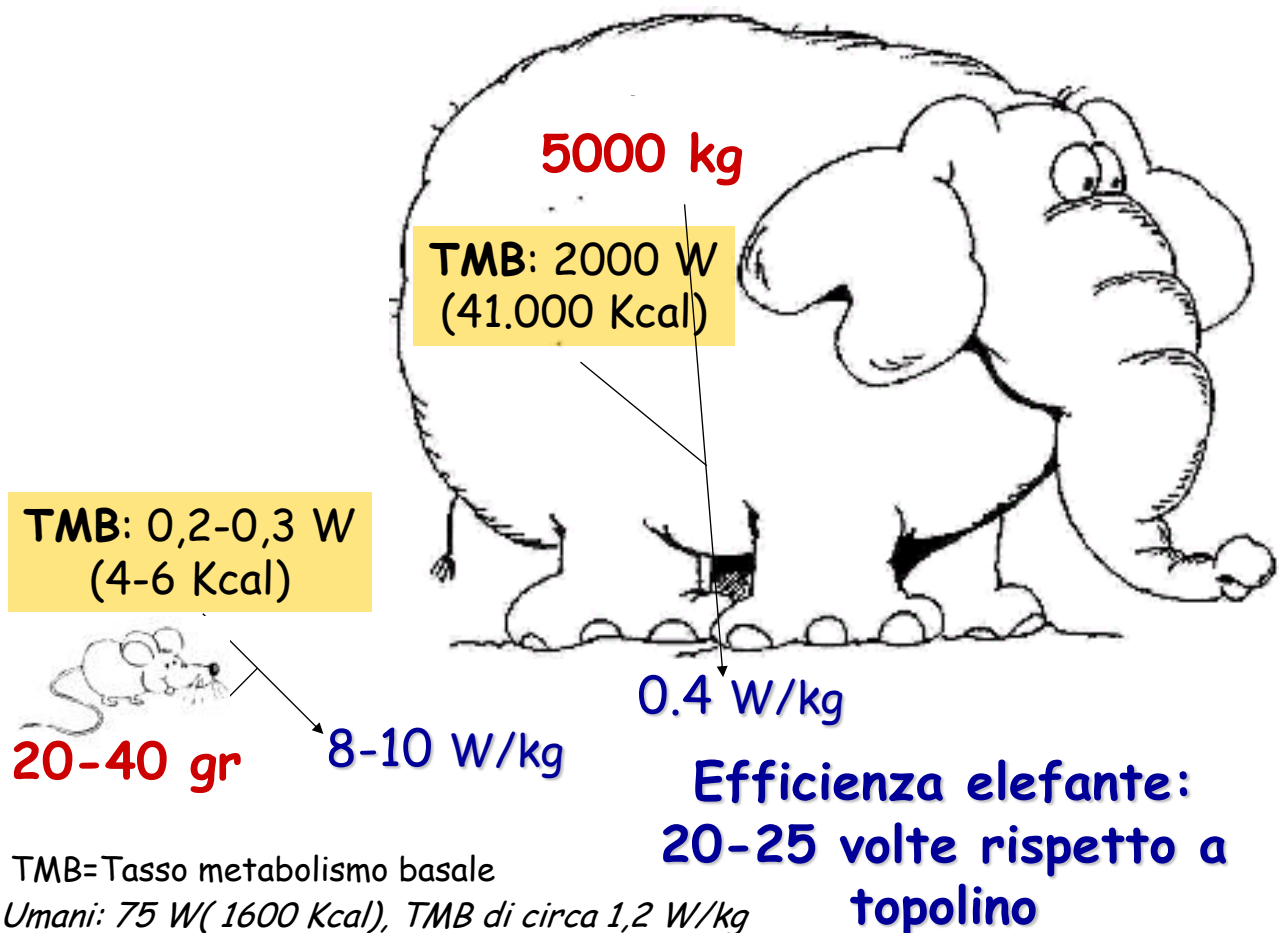
www.fiu.edu/~heithaus/Marine Mammal Class/Lecture Notes/Lec17.doc

Kleiber's Curve:

Miller A. T., 1986, *Energy Metabolism*, F.A. Davis Company Philadelphia, PA.

Blaxter K. 1989, *Energy metabolism in animals and man*, Cambridge University Press, Cambridge, UK.

Kleiber M. 1975, *The Fire of Life: An Introduction to Animal Energetics*, Robert E. Krieger Publishing Company Huntington, NY.



PARADOSSO di JEVONS (effetto rebound)

Qual è la probabilità che le nuove tecnologie consentano una crescita senza che con essa aumenti il degrado ambientale?

William Stanley Jevons (1835-1882) economista inglese, noto perché pioniere della teoria economica contemporanea (neoclassica). Diviene famoso tuttavia per **"The Coal Question (1865)"**

Previsione di crisi da carenza (e ↑ costo) di carbone (sottostima i sostituti, petrolio e idroelettr.). Tuttavia nel Capitolo 7 "Of the Economy of Fuel"

↑ efficienza nell'uso di una risorsa naturale → ↑ scala produttiva → ↑ domanda risorsa

"It is wholly a confusion of ideas to suppose that the economic use of fuel is equivalent to a diminished consumption.

The very contrary is the truth.

As a rule, the new modes of economy will lead to an increase of consumption according to a principle recognized in many parallel instances.... "

"It is the very economy of its (coal) use which leads to its extensive consumption...»

↑ efficienza → ↑ profitti → ↑ imprese e investimenti → ↓ P →

↑ domanda → ↑ uso carbone

forse non in tutti i settori ma ↑ in un settore → ↑ altri settori

Nella storia del motore a vapore "Every such improvement of the engine," he observed, "when effected, does but accelerate anew the consumption of coal. Every branch of manufacture receives a fresh impulse-hand labor is still further replaced by mechanical labor ..." (152-153).

Rilevanza attuale?

Aumento efficienza energetica auto fine '70 → ? Ridotto i consumi di carburante?

Frigoriferi: ↑ efficienza → ↑ dimensioni

"It is the very economy of the use of coal that makes our industry what it is (142)"

TOPO ed ELEFANTE

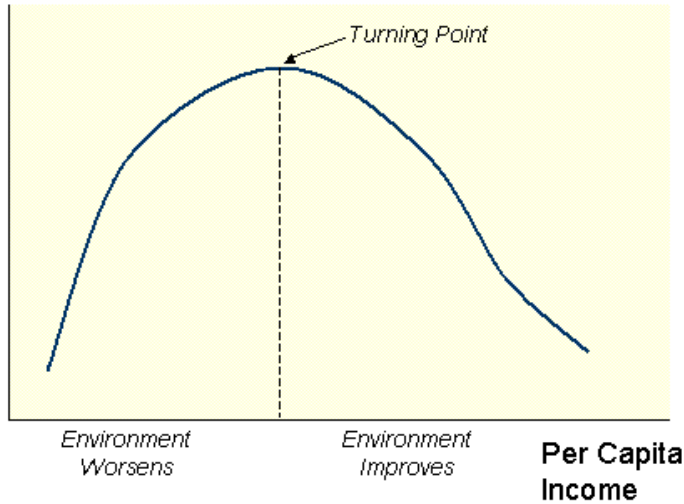
* See M. Giampietro and K. Mayumi, "Another View of Development, Ecological Degradation, and North-South Trade," Review of Social Economy, vol. 56, no. 1, 1998.

J B Foster, 2000, "Capitalism's Environmental Crisis- Is Technology the Answer?" Monthly Review, 52 (7) <http://www.monthlyreview.org/1200jbf.htm>

The EKC «fairytale»

The environmental Kuznets curve

Environmental Degradation



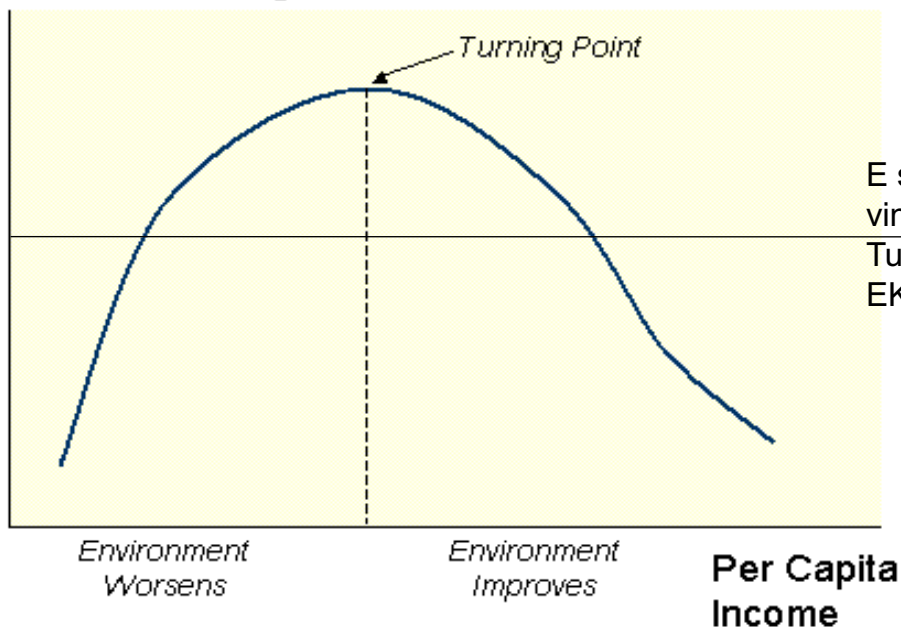
“Will continued economic growth bring ever **greater harm** to the earth’s environment?

Or do increases in income and wealth

sow the seeds for the amelioration of ecological problems?”

(Grossman and Krueger, 1995: 353)

Environmental Degradation

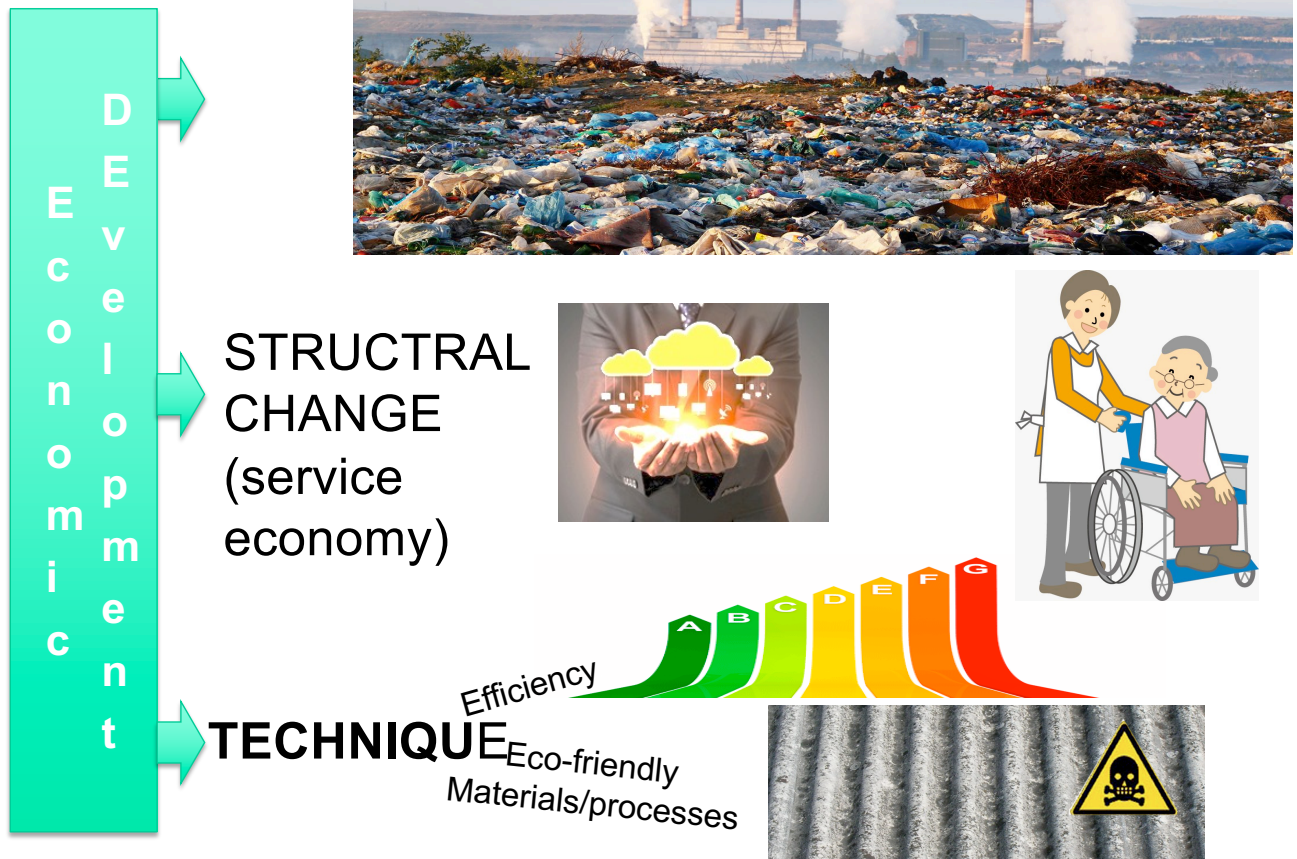


E se ci fossero dei vincoli ecosistemici?
Tunnelling through EKC!

Penn State University, David Abler

http://450.aers.psu.edu/development_environment.cfm

WHY EKC?



At higher levels of development,
structural change towards
information-intensive industries and **services**
coupled with
increased environmental awareness,
enforcement of **env. regulations**
better technology
higher environmental expenditures*
result in **levelling off and gradual decline**
environmental degradation.”

Panayotou (1993, p. 1)

*The environment as a *LUXURY GOOD* alas!)

Some other quotes

“inverted U-shape relation between **environmental degradation** and income per capita” (Stern 1998: 173),

that is, about “a certain inevitability of **environmental degradation** along a country’s development path at an earlier stage of development, and a significant improvement at a later stage, both as a result of economic growth” (Panayotou 1993: preface).

Stern DI. Progress on the environmental Kuznets curve? *Environment and Development Economics* 1998;3:175-198.

Panayotou T. Empirical tests and policy analysis of environmental degradation at different stages of economic development.; Working Paper WP238, Technology and Environment Programme, International Labour Office, Geneva, 1993.

Grossman GM, Krueger AB. Economic growth and the environment. *Quarterly Journal of Economics* 1995;110:353–377.

Recently some economists have argued that economic growth is itself the means to environmental protection.

According to the '**environmental kuznets curve**' or 'inverted U' hypothesis, as a nation's per capita income rises, so environmental damage per capita first rises with it, then levels off, and finally starts to decline.

The World Bank, for example, has embraced this argument with enthusiasm. The evidence is actually mixed. The data are consistent with the hypothesis for some forms of damage with local short-lived effects (sulphur emissions, particulates, faecal coliforms) but not for more dispersed and long-lived pollutants such as carbon dioxide.

In any case, as discussed in Stern et al. (1996), even where data are consistent with the hypothesis, the pattern of per capita income levels and growth rates across the nations of the world can be such that, at the global level, growth and damage are positively correlated over the medium-term future.

Mixed empirical results ... due to

Methodological reasons:

indicators (and databases) used

units included in the sample (OUTLIERS!?!)

shape of the relation tested (quadratic, cubic, non-parametric)

the use of control variables other than income as regressors

econometric bad practices (or even 'mistakes') (time series!!!)

Different environmental phenomena

- Local vs global
- Easy vs difficult to tackle

The model:

in order to compare among countries

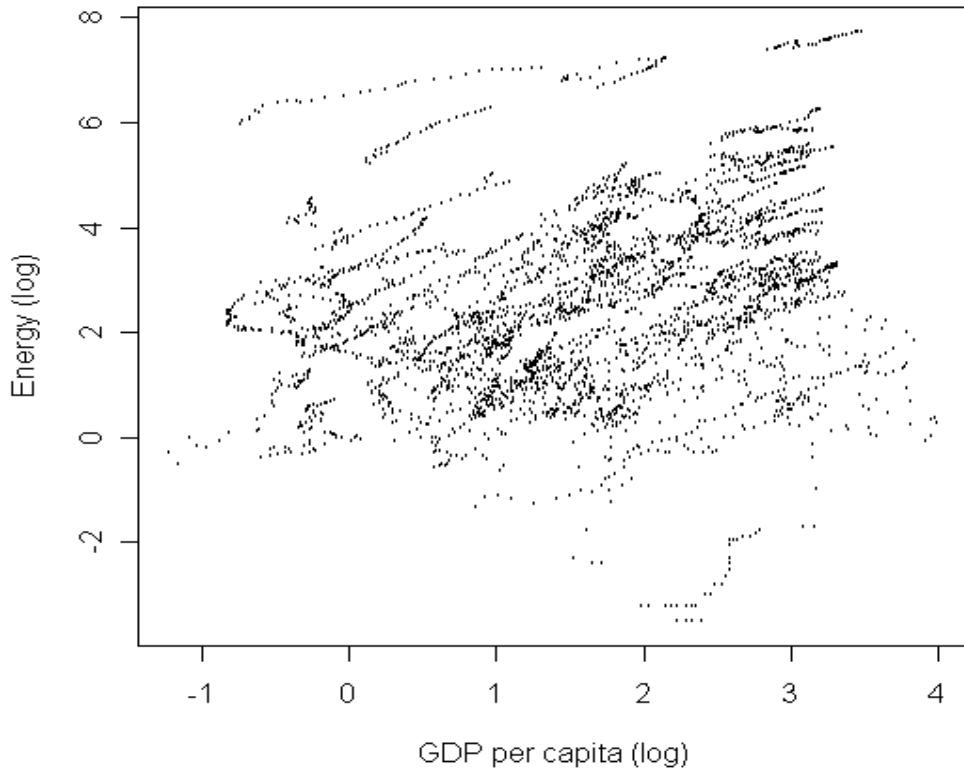
Per capita (!) pressures $\stackrel{?}{=} f(\text{per capita income})$

THIS IS WRONG AND MISLEADING!!!

WHY?

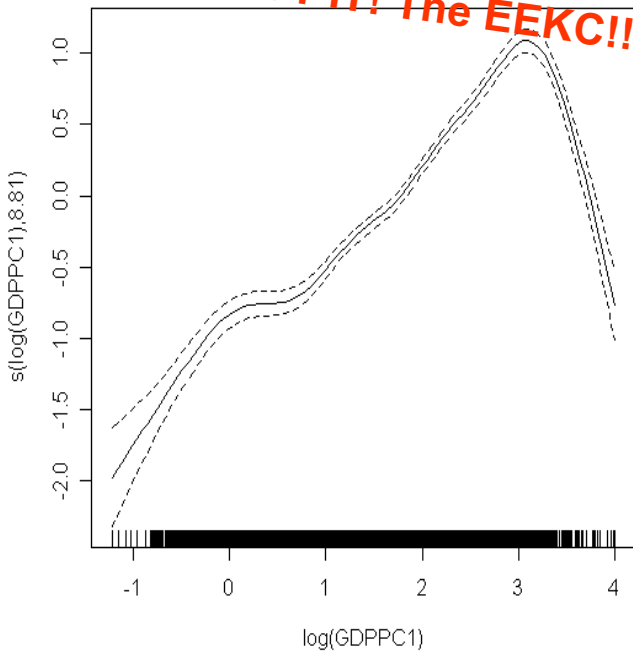
1. Nature "does not care" about per capita emissions. TOTAL emission is the critical issue. (acknowledged in theoretical literature on EKC).
2. Population is a variable, not a constant.

Data for 113 countries, 1971-2001
 Energy: Total Primary Energy Supply, Mtoes
 GDP per capita: Purchasing Power Parity 1995 \$, thousands
 Source: IEA

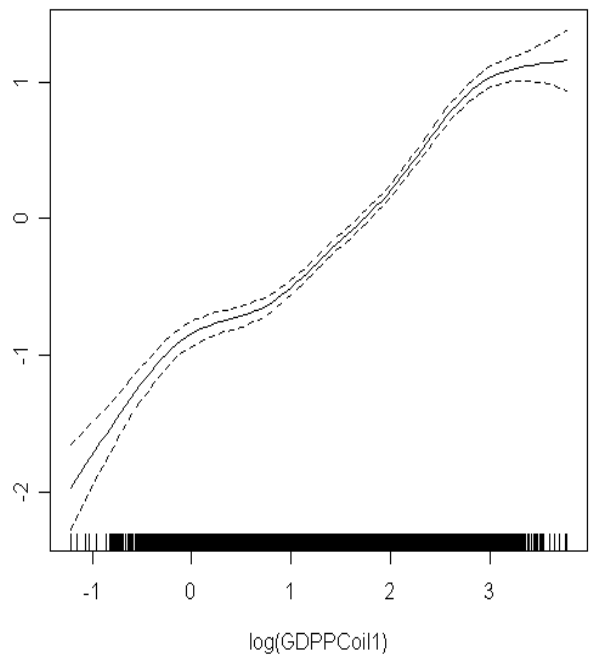


Pooled Countries: **NON** parametric analysis RESULTS

WE GOT IT! The EEKC!!!

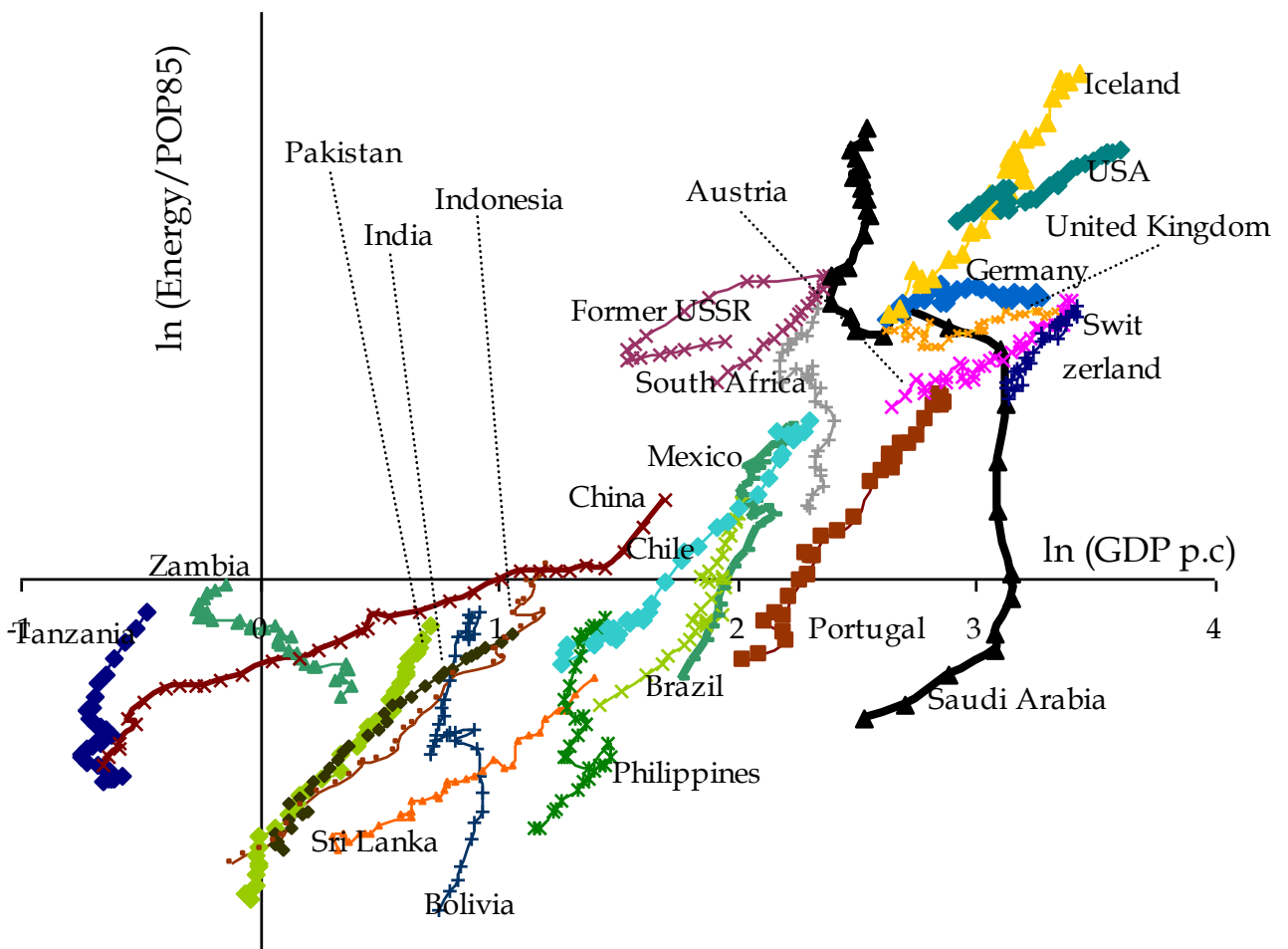
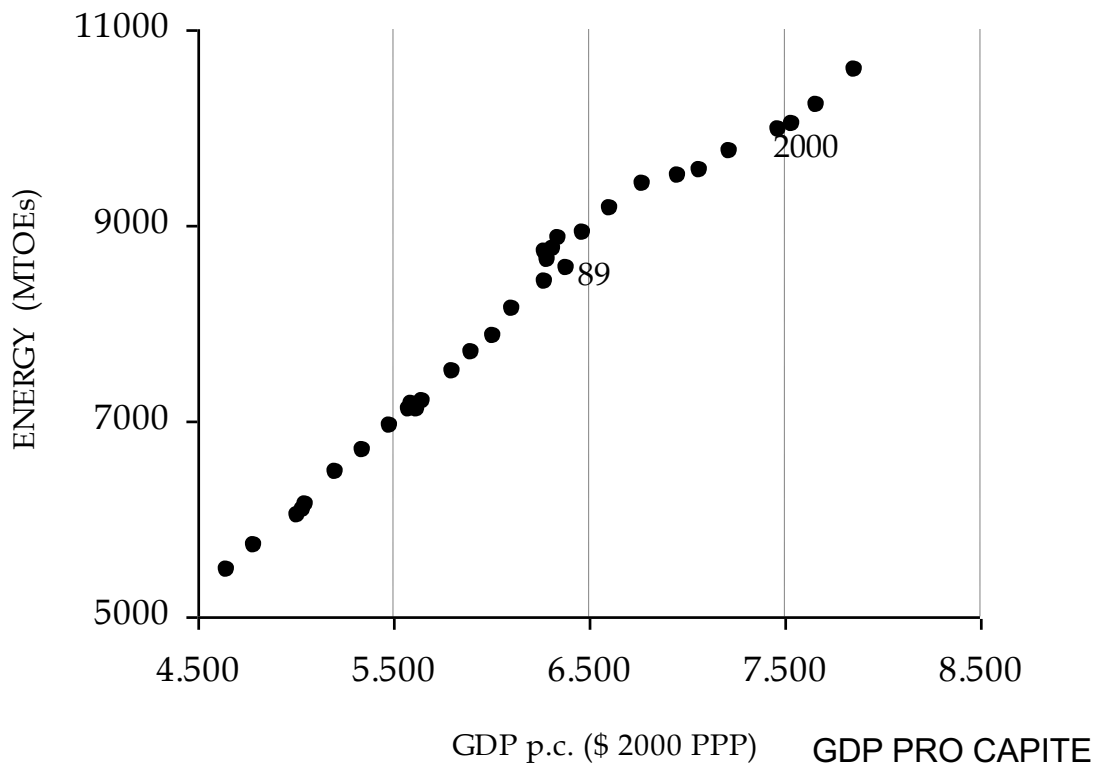


ALL COUNTRIES (113)

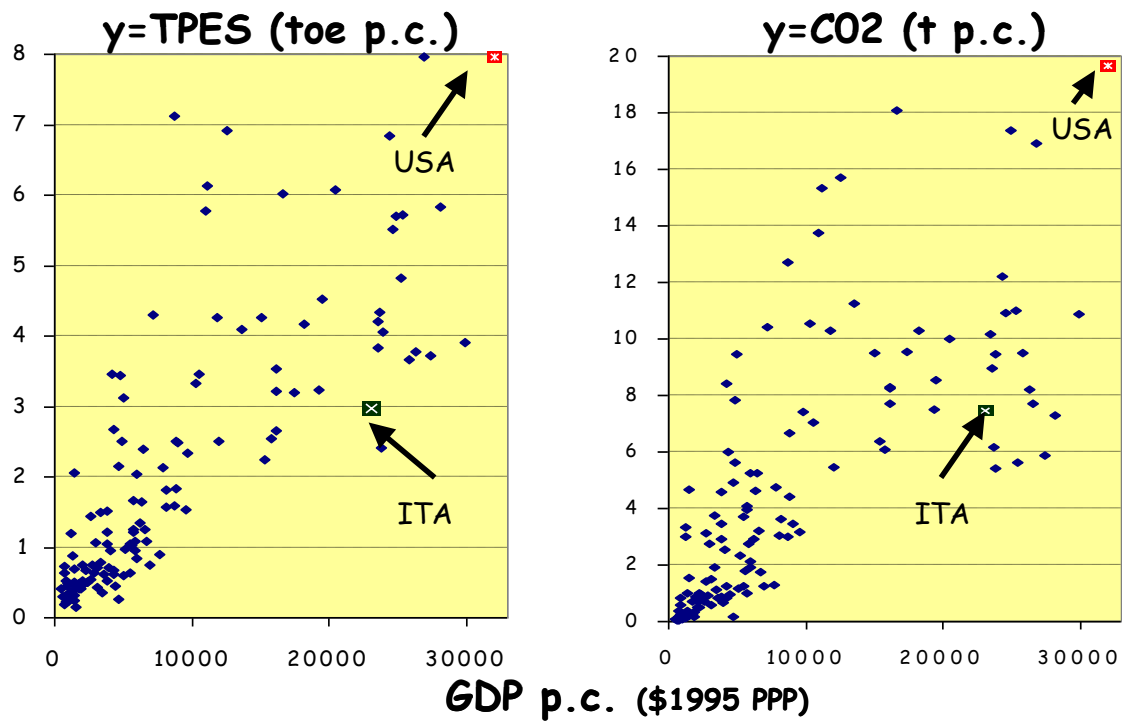


WITHOUT: Brunei, Qatar, United Arab Emirates

mondo



EKC: Environmental Kuznets Curve ???



Dati: IEA (International Energy Agency), *Key World Energy Statistics -- 2004*
<http://library.iea.org/dbtw-wpd/Textbase/nppdf/free/2004/keyworld2004.pdf>