

Kuznets (1971) Stiglitz (2009)

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„GDP is not wrong *as such*, but wrongly used.”

It has long been clear that GDP is an inadequate metric to gauge well-being over time particularly in its economic, environmental, and social dimensions, some aspects of which are often referred to as *sustainability*.



CHALLENGE: Measuring

Measuring profits is easy but how to measure environmental protection and social justice?

- **How to measure progress in those areas?**
- **One company reduces its emissions of greenhouse gases; one increases its spending on recycling; another provides free child-care facilities for its workers; another rises the wages of its lowest-paid workers. All this costs money and reduces profits.**
- **Which has done more to protect the environment?**
- **Which has done more to advance social progress?**

Simon Kuznets – Nobel Prize Lecture 1971

- A country's economic growth may be defined as a long-term rise in capacity to supply increasingly diverse economic goods to its population, this growing capacity based on advancing technology and the institutional and ideological adjustments that it demands. All three components of the definition are important. The sustained rise in the supply of goods is the *result* of economic growth, by which it is identified.

- First, the changes in conditions of life suggested by "urbanization" clearly involved a variety of costs and returns that are not now included in economic measurement, and some of which may never be susceptible to measurement. Internal migration, from the countryside to the cities (within a country, and often international) represented substantial costs in the pulling up of roots and the adjustment to the anonymity and higher costs of urban living. The learning of new skills and the declining value of previously acquired skills was clearly a costly process - to both the individuals and to society. But if such costs were omitted from measurement, as they still are in conventional accounts, so were some returns. Urban life, with its denser population, provided amenities and spiritual goods that were not available in the "dull and brutish" life of the countryside; and the new skills, once learned, were often a more adequate basis for a richer life than the old. This comment on the hidden costs and returns involved in the shift toward urban life may apply to many other costs and returns involved in other shifts imposed by economic growth, e.g. in the character of participation in economic activity, in the social values, and in the new pressures on deviant members of society.

any specific problem so generated will be temporary - although we shall never be free of them

- the negative effects of growth have never been viewed as so far outweighing its positive contribution as to lead to its renunciation - no matter how crude the underlying calculus may have been.
- one may assume that once an unexpected negative result of growth emerges, the potential of material and social technology is aimed at its reduction or removal. In many cases these negative results were allowed to accumulate and to become serious technological or social problems because it was so difficult to foresee them early enough in the process to take effective preventive or ameliorative action. Even when such action was initiated, there may have been delay in the effective technological or policy solution. Still, one may justifiably argue, in the light of the history of economic growth, in which a succession of such unexpected negative results has been overcome, that any specific problem so generated will be temporary - although we shall never be free of them, no matter what economic development is attained.

labor-saving inventions may not be suited to countries...

- Thus, modern technology with its emphasis on labor-saving inventions may not be suited to countries with a plethora of labor but a scarcity of other factors, such as land and water; and modern institutions, with their emphasis on personal responsibility and pursuit of economic interest, may not be suited to the more traditional life patterns of the agricultural communities that predominate in many less developed countries.

Is it the same job?
Which one is more sustainable?



The six characteristics of modern (1971) economic growth



Six characteristics of modern economic growth have emerged in the analysis based on conventional measures of national product and its components, population, labor force, and the like. First and most obvious are the high rates of growth of per capita product and of population in the developed countries - both large multiples of the previous rates observable in these countries and of those in the rest of the world, at least until the recent decade or two.³ Second, the rate of rise in productivity, i.e. of output per unit of all inputs, is high, even when we include among inputs other factors in addition to labor, the major productive factor - and here too the rate is a large multiple of the rate in the past.⁴ Third, the rate of structural transformation of the economy is high. Major aspects of structural change include the shift away from agriculture to non-agricultural pursuits and, recently, away from industry to services; a change in the scale of productive units, and a related shift from personal enterprise to impersonal organization of economic firms, with a corresponding change in the occupational status of labor.⁵ Shifts in several others aspects of economic structure could be added (in the structure of consumption, in the relative shares of domestic and foreign supplies, etc.). Fourth, the closely related and extremely important structures of society and its ideology have also changed rapidly. Urbanization and secularization come easily to mind as components of what sociologists term the process of modernization. Fifth, the economically developed countries, by means of the increased power of technology, particularly in transport and communication (both peaceful and warlike), have the propensity to reach out to the rest of the world - thus making for one world in the sense in which this was not true in any pre-modern epoch.⁶ Sixth, the spread of modern economic growth, despite its worldwide partial effects, is limited in that the economic performance in countries accounting for three-quarters of world population still falls far short of the minimum levels feasible with the potential of modern technology.⁷

The six characteristics of modern economic growth (Kuznets 1971)

1. the high rates of growth of per capita product and of population in the developed countries
2. the rate of rise in productivity,
3. the rate of structural transformation of the economy is high. (from agriculture to non-agricultural pursuits and, from industry to services; a change in the scale of productive units, (in the structure of consumption, in the relative shares of domestic and foreign supplies, etc.).
4. the closely related and extremely important structures of society and its ideology have also changed rapidly. Urbanization and secularization come easily to mind as components of what sociologists term the process of modernization.
5. the economically developed countries, by means of the increased power of technology, particularly in transport and communication (both peaceful and warlike), have the propensity to reach out to the rest of the world - thus making for one world in the sense in which this was not true in any pre-modern epoch.
6. the spread of modern economic growth, despite its worldwide partial effects, is limited in that the economic performance in countries accounting for three-quarters of world population still falls far short of the minimum levels feasible with the potential of modern technology.

...the conventional measures of national product and its components do not reflect many costs of adjustment in the economic and social structures.

- The earlier theory ..defined the productive factors in a relatively narrow way, and left the rise in productivity as an unexplained gap, as a measure of our ignorance.
- to expand the national accounting framework to encompass the so far hidden but clearly important costs, for example, in education as capital investment, in the shift to urban life, or in the pollution and other negative results of mass production.
- These efforts will also uncover some so far unmeasured positive returns - in the way of greater health and longevity, greater mobility, more leisure, less income inequality, and the like. The related efforts to include the additions to knowledge in the framework of economic analysis, the greater attention to the uses of time and to the household as the focus of economic decision not only on consumption but also on investment, are steps in the same direction.

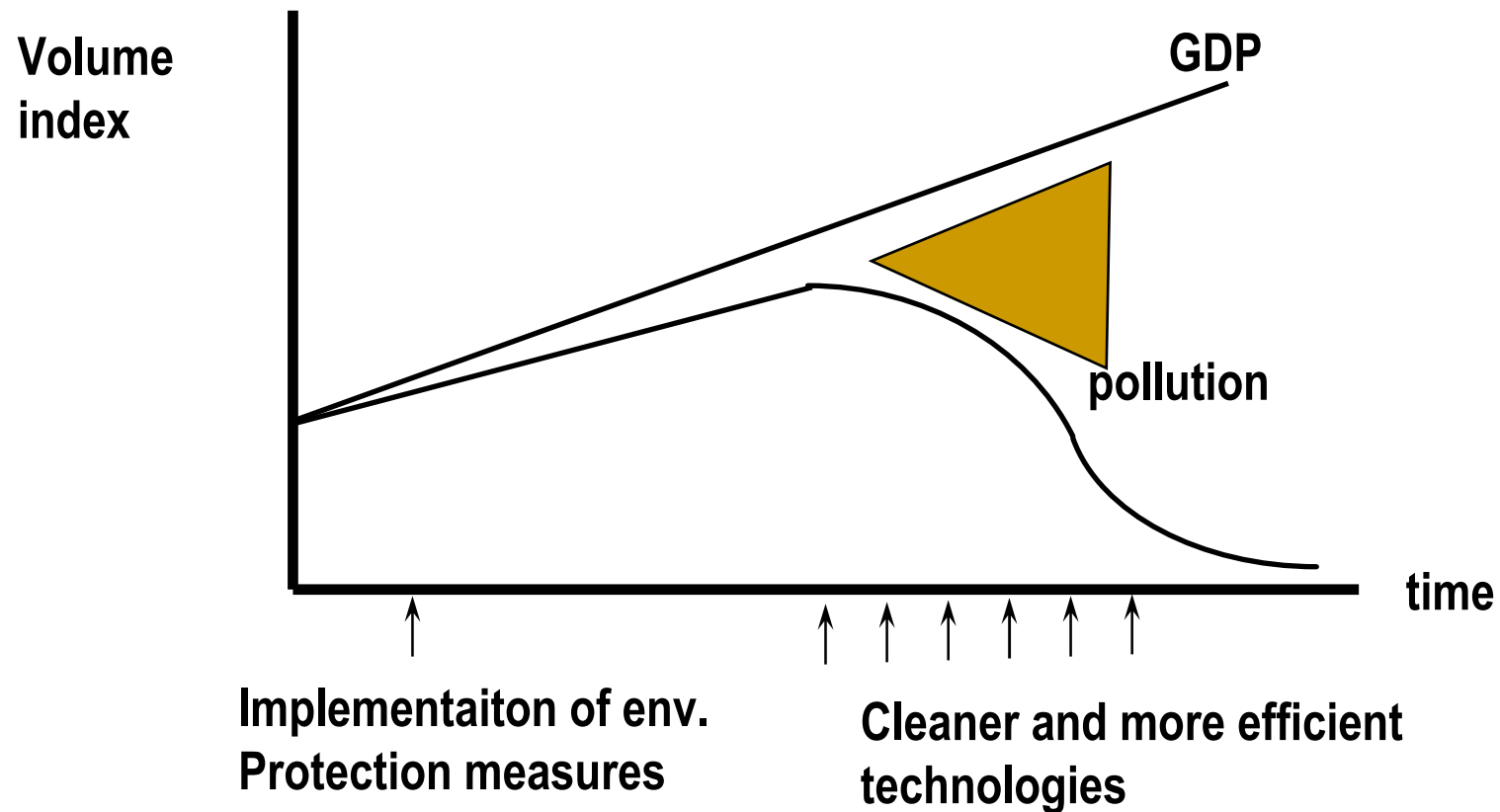
- Outline: Does it exist, if so why,
- and is it policy relevant? and is it policy relevant?
- Initially, an empirical observation. Initially, an empirical observation.
- Most studies based on cross Most studies based on cross-country data. country data.
- Different results with time series data. Different results with time series data.
- Policy significance? Policy significance?
- Structural explanation

Central and Eastern Europe municipal waste generation in kg per capita

	1995	2000	2003
Czech Republic	302	334	280
Hungary	465	454	464
Poland	285	316	260
Slovak Republic	339	316	319
Austria	437	579	612

„Kuznets” curves

Theoretic model*



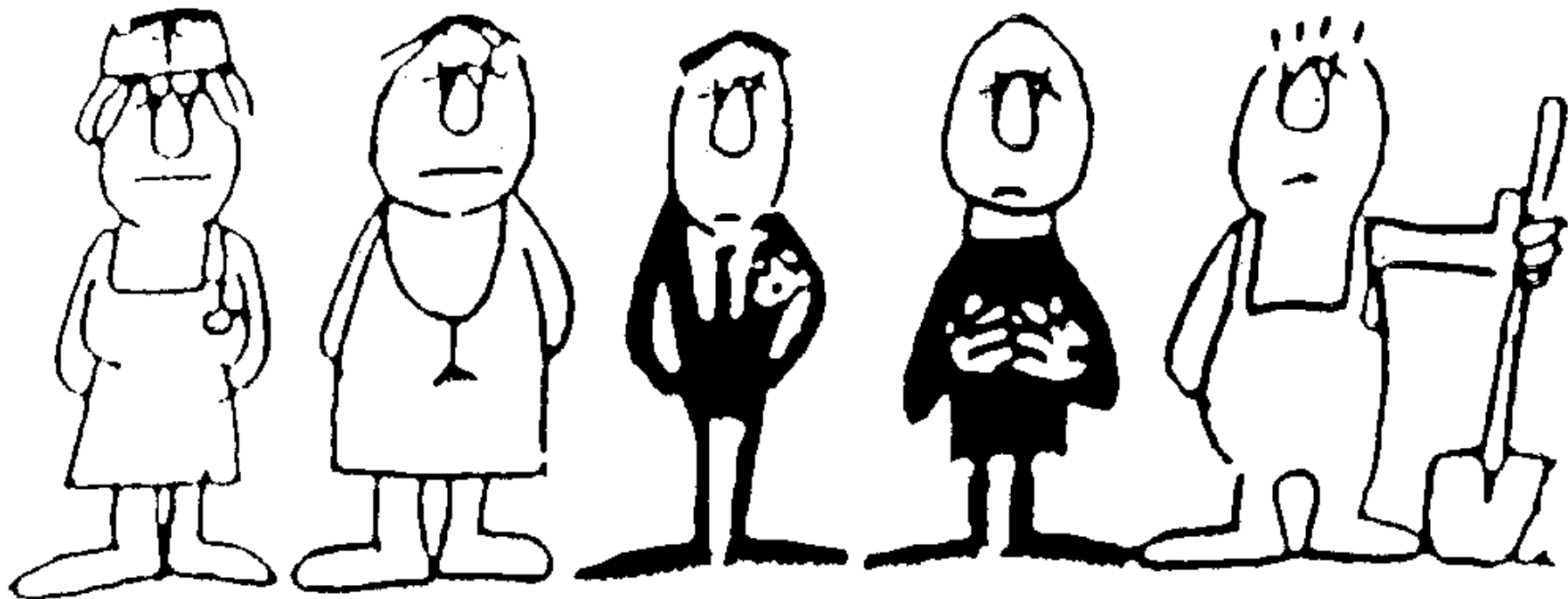
*Source:
OECD 1991
U.S. Environmental Protection Agency 1991. 40. oldal

GYETEM
Mányi Kar

www.uni-corvinus.hu/gkar

EKC

- The EKC hypothesizes that the relation between income per capita and emissions between income per capita and emissions has an inverted U shape.
- At relatively low income levels, emissions increase with income, but after some “turning point”, emissions decrease with income.





Simon Kuznets

Economic growth: the wrong measure

- only paid work is taken into account in growth calculations.
- a shift away from self-reliance generates economic growth without any increase in well-being.
- does not take any account of non-financial aspects of well-being, such as working time.
- no account is taken of the effects of changes in uncertainty or financial insecurity.
- neither the immediate social and psychological costs of separating young families nor any longer term effects, e.g. on crime or health, are counted.
- no account of the distribution of income.
- Economic growth does not, in itself, make people's lives any better

...sexual activity enters strongly positively in happiness equations.

- The links between income, sexual behavior and reported happiness are studied using recent data on a sample of 16,000 adult Americans.
- Higher income does not buy more sex or more sexual partners.
- Married people have more sex than those who are single, divorced, widowed or separated.
- The happiness-maximizing number of sexual partners in the previous year is calculated to be 1.
- Highly educated females tend to have fewer sexual partners.
- Source: David G. Blanchflower Andrew J. Oswald 2004 Money, Sex and Happiness: An Empirical Study* Scand.. J. of Economics 106(3), 393–415, 2004

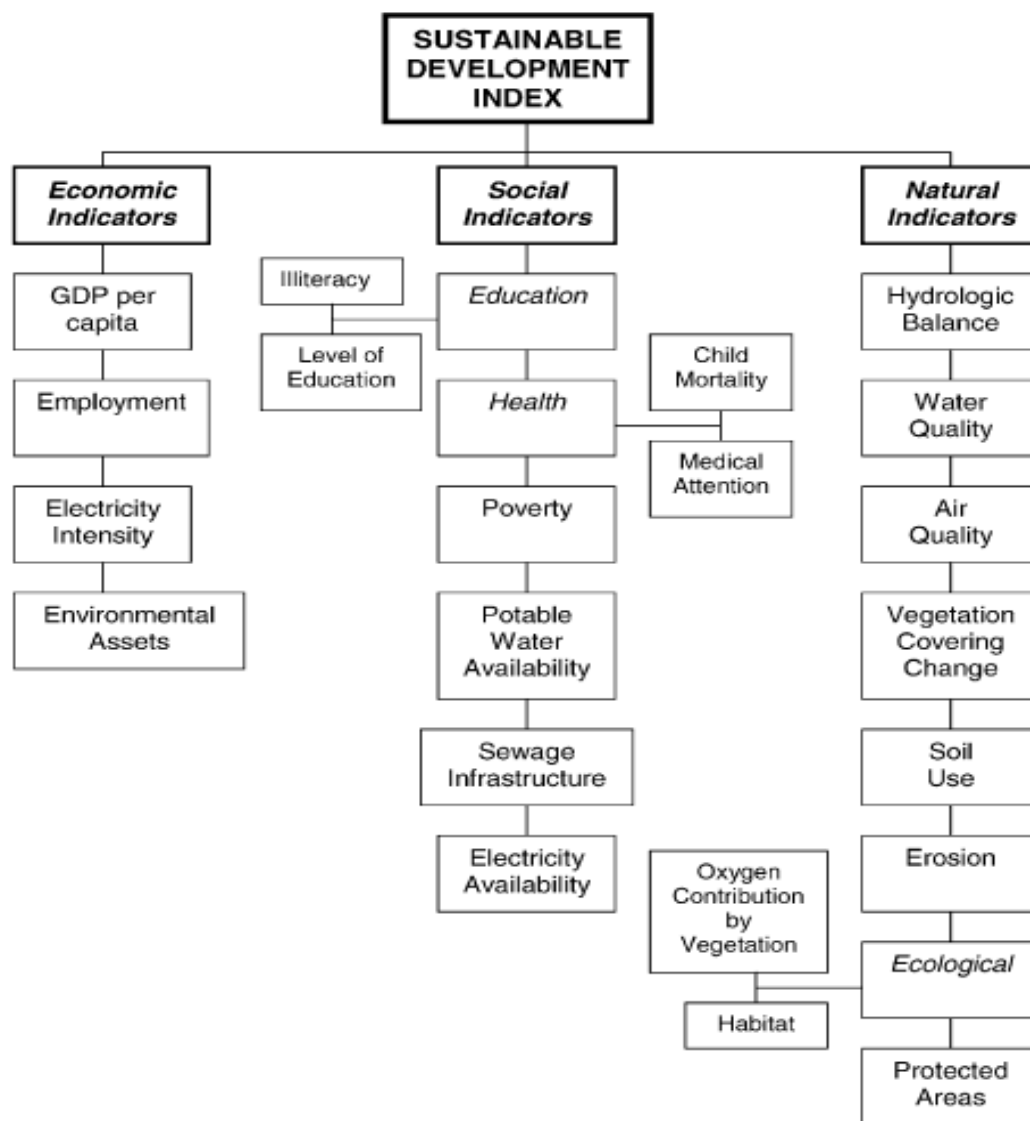


Fig. 2. Tree representing the Sustainable Development Index considering 21 indicators.

Europe and the World 1990-2050

	1990	2001	2010	2030	2050
World population	5,2	6,1	6,8	8,1	8,9
Per capita GDP in USD	5300	6400	8100	12100	17100
Europe population	564	588	599	606	586
Per capita GDP in USD	14849	17533	21124	31496	43005

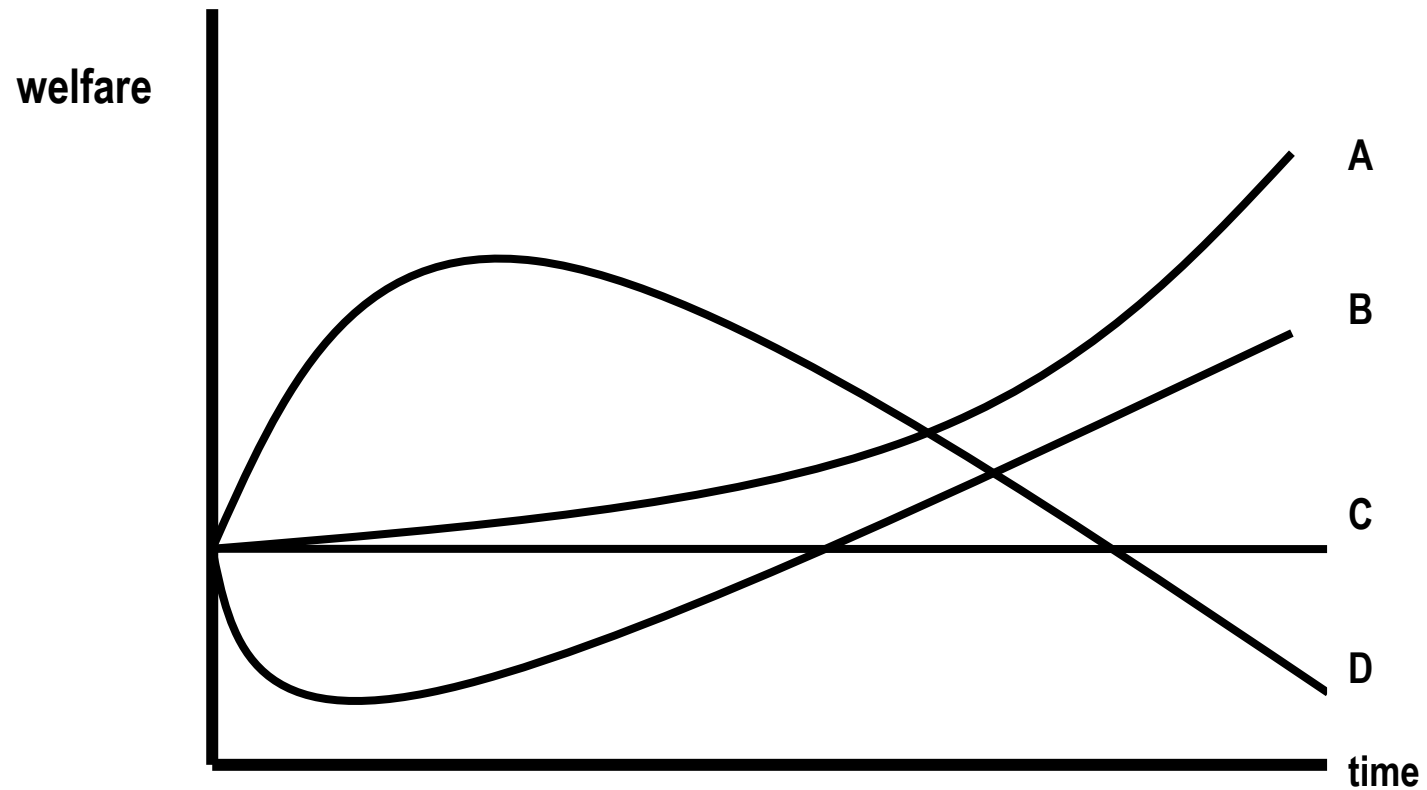
Source: WETO-H

2: Per capita GDP, by world region (€2005/year PPP)

	1990	2000	2010	2030	2050
WORLD	5 300	6 400	8 100	12 100	17 100
North America	23 800	29 200	35 400	45 400	56 000
Europe	13 700	16 200	19 500	29 100	39 800
Japan - Pacific	18 700	21 000	25 800	37 600	52 500
CIS	7 000	4 800	7 300	13 700	21 400
Latin America	5 100	6 100	7 100	10 800	15 500
Africa	1 700	1 900	2 100	2 800	4 500
Middle East	4 400	5 400	6 100	9 000	14 800
Asia	1 700	3 100	4 800	9 000	14 400

Understanding sustainability as

- **1. Constant consumption over time**
- **2. Constant stock of natural resources.**
- **3. Intergenerational equity.**



Sustainable (A,B,C) and non sustainable (D) development path

The priorities are changing

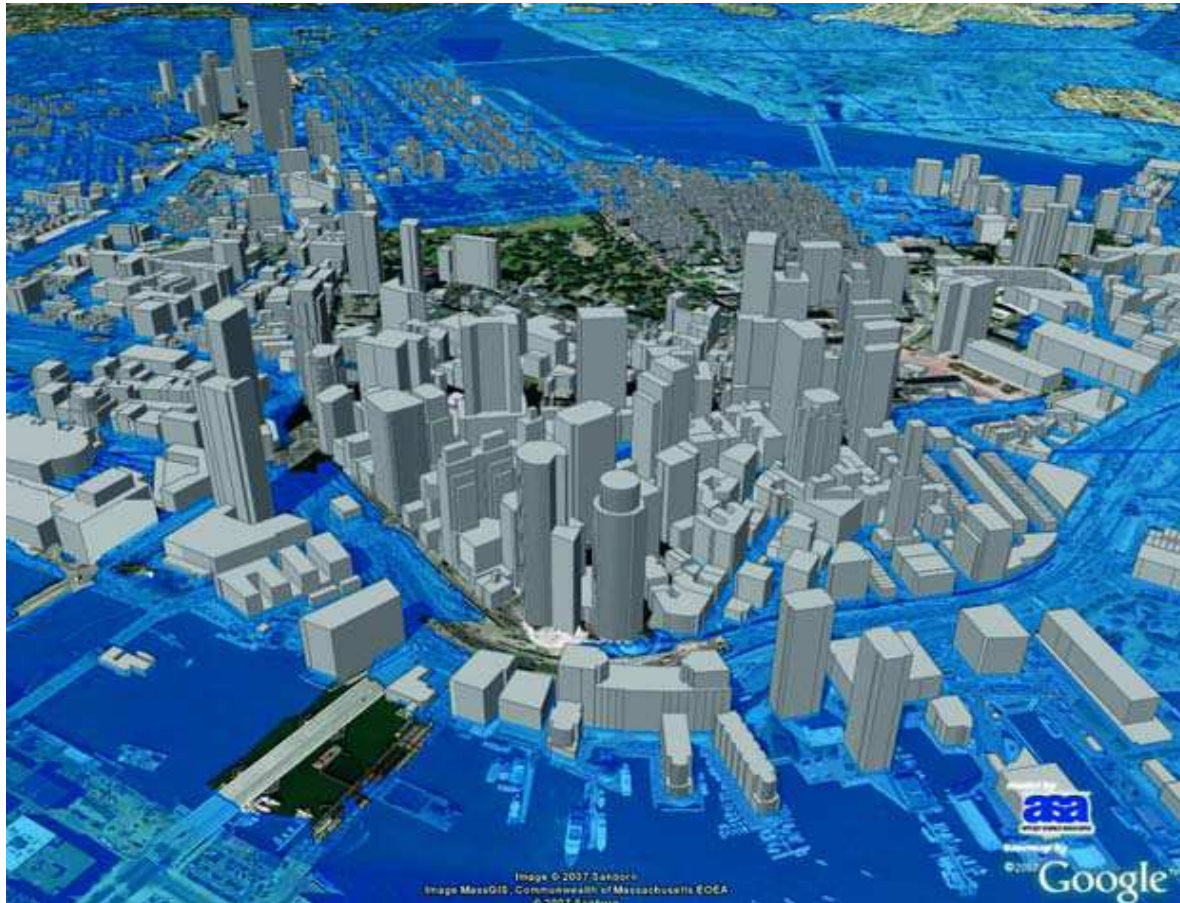
- Polluting industries left the developed world.
- Most of the environmental problems has been solved (cleaner production, waste minimization, eco-efficiency- profitable solutions.
- „Only” problem the consumption and consumerism.



Europe and the World 1990-2050

	1990	2001	2010	2030	2050
World population	5,2	6,1	6,8	8,1	8,9
Per capita GDP in Euro (2005 ppp)	5300	6400	8100	12100	17100
Europe's population	564	588	599	606	586
Per capita GDP in Euro (2005 ppp)	13700	16200	19500	29100	39800

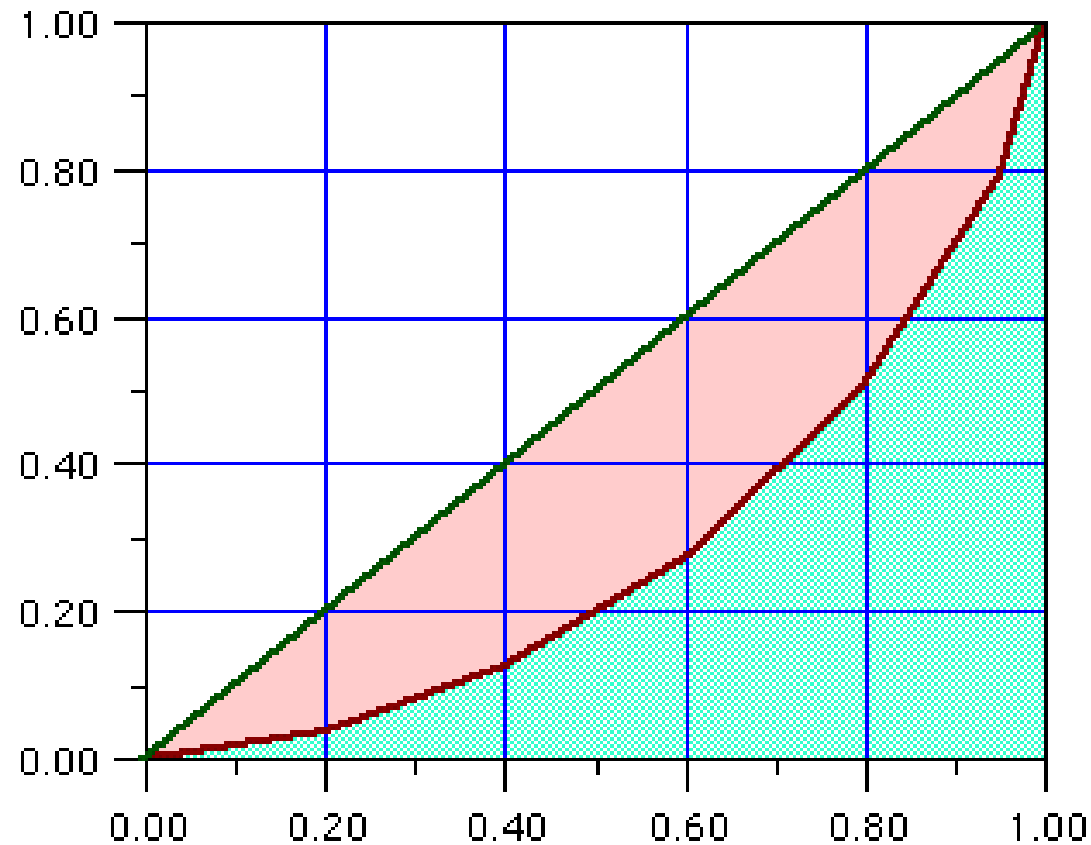
Source: WETO-H



Inundation Model of Boston

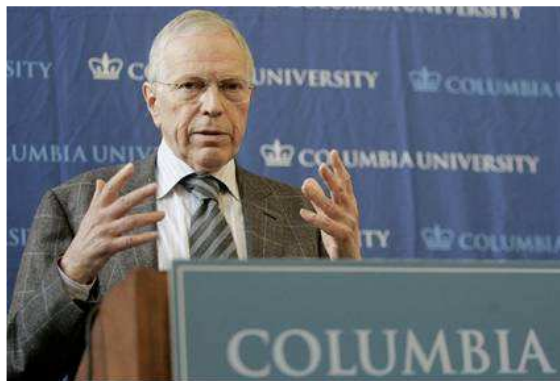
A computer simulation of Boston in 2100 shows the projected combined effects of natural subsidence over the century, a sea level rise of 15” inches due to global warming, a high tide, and storm surge. However, with accelerating deterioration and melting of the Antarctica and Greenland ice sheets, this scenario could occur much sooner, according to leading US glaciologists. MODEL BY APPLIED SCIENCE ASSOCIATES, INC.

Lorenz Curve and Gini Coefficient



...too much theorizing and not enough actual research.

- ...too ideological,
- ...too preoccupied with theory and mathematics,
- ...too narrowly focused on problems facing Wall Street instead of addressing pressing global issues like inequality, poverty and environment.
- 1990s when economists of University of Chicago received five Nobels „some of that work was clearly not breakthrough in any fundamental sense.”
- (Int. Herald Trib. Patricia Cohen- Stiglitz 2002, Gary Becker 1992)



Edmund S. Phelps

(Columbia University, 2006 Nobel prize winner)

- The very essence of capitalism is not the free market, the laissez-faire, but the innovation, a permanent improvement of work productivity.
- Capitalism improved due to higher productivity, and not bigger state intervention.
- Man of intelligence and good will suggest that the entrepreneurial spirit has to be embedded in a new economy, oriented towards social investments (like climate stabilization, energy efficiency).

Figyelő, 2009/1.



Kemal Dervis

(Chief Administrator of UNDP)

- A world-wide financial stimulating pocket is needed, which mitigates the fall of the households' consumption.
- Each country hopes that others will stimulate global demand and using its own export possibilities will restore the economy.
- Each country may be tempted to implement protectionism and defend its jobs by curbing imports.
- ***The solution needs a globally coordinated crisis management package, which aims at developing the new generation of low consumption and low exhaustion cars and creating green jobs.***
- Spreading the social network may help the more needy, besides, it may have a strong multiplication effect, as the **poor have not other choices but spending.**

HVG, 2009. febr. 7.

Accepted definitions of SC

Ofstad 1994: „The use of goods and services that respond to basic needs and bring a better quality of life, while minimizing the use of natural resources, toxic materials and emissions of waste and pollutants over the lifecycle, so as not to jeopardize the needs of future generations.”

UNEP 1999: „Sustainable consumption is not about consuming less, it is about consuming differently, consuming efficiently, and having an improved quality of life”

National Consumer Council, UK, 2003: „SC is a balancing act. It is about consuming in such a way as to protect the environment, use natural resources wisely and promote quality of life now, while **not spoiling the lives of future consumers.**”



Elements of the debate on SC concept

Critics about the concept of „consuming efficiently” :

- It tends to obscure the scale of resource consumption patterns („rebound effect”).
- Tension: what should be (or should not be) consumed?
- Difference or congruence between material resource consumption (see: resource scarcity and environmental degradation) and economic consumption (final consumers do not buy materials per se, they buy goods and services)?

→lifestyle change is essential not only desirable

International Climate and Energy Policies

EU: 3 x 20 % until 2020

- Binding target of 20% share of renewable energies in the EU to 2020
- Increasing energy efficiency by 20% compared to 2020 forecast
- 20% CO₂-Emission reduction to 2020, 30 % if others follow

G8, June 2007

- To “seriously consider” 50% reduction of CO₂ emissions in 2050 compared to emissions in 1990
- Negotiations to an agreement in the framework of the UN running from 2012

New U.S. president in 2009

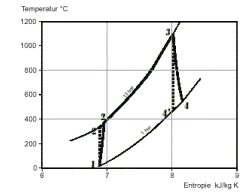
- Aiming for 80 % carbon reduction by 2050
- Waxman Act: attempt to introduce carbon trading in the U.S.
- “Green stimulus”: Investments in renewable energy & energy efficiency

UNFCCC - COP 15, Copenhagen, December 2009

- Agreement on post-Kyoto regime?



Renewable Energy – a Growth Market... ...so far driven by Technology and Policies



§, €



www.powergeneration.siemens.com



John Ruskin 1819-1900



“THERE IS NO WEALTH BUT LIFE,”
HE WROTE, SETTING DOWN THE CENTRAL
IDEA OF NEW ECONOMICS:

“LIFE, INCLUDING ALL ITS POWERS OF LOVE,
OF JOY, AND OF ADMIRATION. THAT COUNTRY
IS THE RICHEST WHICH NOURISHES THE GREATEST
NUMBER OF NOBLE AND HAPPY HUMAN BEINGS;

THAT MAN IS RICHEST
WHO, HAVING
PERFECTED THE
FUNCTIONS OF
HIS OWN LIFE
TO THE UTMOST,
HAS ALSO THE
WIDEST HELPFUL
INFLUENCE.”



John Ruskin
1819 – 1900

Background

- International aviation is responsible for 2.5% to 3% of global anthropogenic CO₂ emissions
- EU: Proposal COM (2006) 818 final to include aviation activities in the scheme for „greenhouse gas emission allowance trading“ (EU-ETS)
- EU-ETS
 - In force since Jan 2005 (Directive 2003/87/EC)
 - Is connected with the flexible Kyoto mechanisms
 - EU allowances are compatible with Kyoto Assigned Amount Units (EU-A can be sold to other countries)
 - Use of emission reduction credits allowed in the EU-ETS (Directive 2004/101/EC)

Inclusion of Airlines in Emission Trading

- Air transport sector to be included in the EU-ETS from 2012
- Policy goal: Stabilise emissions at 2005 level
- Total number of allowances: in 2012 97% of average emissions 2004-2006; in 2013 95% of 2004-2006
- Initially: 85% of allowances are allocated free of charge, 15% are auctioned
- Airlines will have to purchase allowances insofar as they exceed an individually computed benchmark
- Especially due to its continuing growth rate, the airline industry is assumed to be an allowance purchasing industry

Airlines operating flights within, into and out of the EU will face additional costs

Cost Effects (SIN-FRA Example)



Additional Costs for Airlines:

SIN-FRA: $\Delta + 5,925.44 \text{ €}$

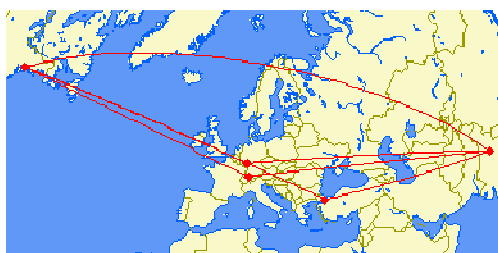
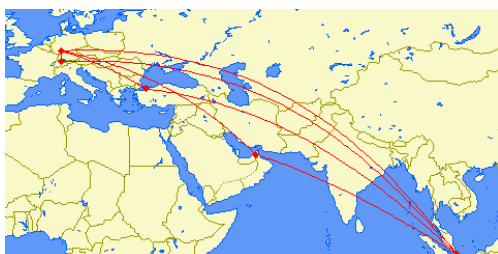
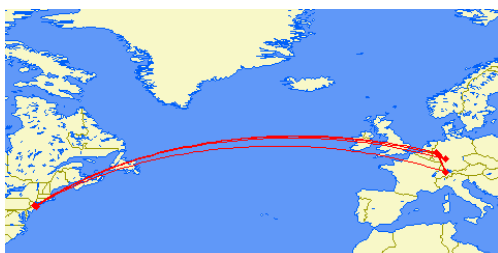
SIN-ZRH-FRA: $\Delta + 144,59 \text{ €}$

SIN-IST-FRA: $\Delta + 600.15 \text{ €}$

SIN-DXB-FRA: $\Delta + 2,990.32 \text{ €}$

Source: Albers, Sascha; Bühne, Jan-André; Peters, Heiko: "Will the EU-ETS instigate airline network reconfigurations?", Journal of Air Transport Management, Vol. 15, No. 1, 2009, pp. 1-6.

Selected Flight Routes for Cost and Demand Assessment



Traffic Regions	Flight Routes		
	Origin	Stopover	Destin.
North America - Europe	EWR	-	CGN
	EWR	ZRH	CGN
	EWR	FRA	CGN
	JFK	-	DUS
	EWR	ZRH	DUS
	EWR	FRA	DUS
Asia-Pacific - Europe	SIN	-	FRA
	SIN	ZRH	FRA
	SIN	IST	FRA
	SIN	DXB	FRA
North America - Asia-Pacific via Europe	EWR	-	DEL
	EWR	FRA	DEL
	EWR	ZRH	DEL
	EWR	IST	DEL

Source: Albers, Sascha; Bühne, Jan-André; Peters, Heiko. "Will the EU-ETS instigate airline network reconfigurations?", Journal of Air Transport Management, Vol. 15, No. 1, 2009, pp. 1-6.

Thank you for your attention!