

Sustainability

- Explain it with your own terms

EcoNetworks, Co.

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My Brief Background

- Environmental Economics & Policies (UC Berkeley)
 - Thesis: Community currency and game theory
 - Book translation “Future of Money”
- Japan for Sustainability (Communication Platform)
 - JFS Sustainability Index
 - Asia for Sustainability
- EcoNetworks, Co. (Sustainability Consulting Firm)
 - Consulting
 - visions/targets/strategy
 - reporting
 - Communication
 - contents
 - dialogue
 - social networking

Japan for Sustainability - www.japanfs.org

Technology

Ocean Thermal Energy Conversion Plant to be Demonstrated in Okinawa

Japanese companies IHI Plant Construction Co., Xenosys Inc., and Yokogawa Electric Corp. announced on July 9, 2012, that they have jointly won a contract from Okinawa Prefecture for a fiscal 2012 pilot project to use deep seawater for electricity generation. Plant builder IHI, Xenosys, a specialist in thermal energy conversion technologies, and Yokogawa Electric, a provider of control and monitoring systems for plant facilities, will work together to demonstrate their ocean thermal energy conversion (OTEC) technologies in Okinawa.


TAG
—
[Manufacturing Industry](#) , [Technology](#)

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
PR (ADVERTISEMENT FROM JFS'S SUPPORTING ORGANIZATIONS)





EcoNetworks Co.

RECENT ARTICLES

 2012.11.17 Sat
New Solar-Powered Cap with LED Lights, Sales Launched
★ **Eco-product/ Business**
Landport Co., a Japanese retailer of miscellaneous goods, announced on July 26, 2012, the launch of sales of its new "LED Solar Cap," whi...

 2012.11.16 Fri
Fujitsu Launches First Internet Cloud-based Management Service for Food and Agricultural Industries ★ **Eco-product/ Business**
Fujitsu Ltd. announced July 18, 2012, the launch of its innovative "Akisa" Internet cloud-based service for the food and agricultura...


 2012.11.15 Thu
Survey Shows Increasing Awareness of 3Rs and Biodiversity
! **Other**
According to the Japanese government's "Public Opinion Survey on the Environmental Problems , the terms "3Rs (reduce, reuse and recycle)"...

 2012.11.14 Wed
Kyushu University Verifies Correlation between Airflow, Wind Turbine Performance ★ **Technology**
Visualized airflow at 70 meters above the ground, the height of wind turbine's


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INFORMATION

2012.05.22 Tue
"Learn to Create in Tohoku" Projects
 "Learning Journey in Tohoku" August 20-26, 2012

FEATURED ARTICLE

2012.11.06 Tue
Global Youth See Reconstruction Efforts Firsthand after 2011 Japan Earthquake -- Transforming What Survivors Learned Into Lessons for the World
 Japan for Sustainability (JFS) organized the "Learning Journey in Tohoku" from August 20 to August 25 in

We share information on developments and activities originating in Japan that lead toward sustainability, with the aim of building momentum toward a sustainable path for the world.

Network

- Subscribers from 191 countries
- Website access 100,000+, articles 2000+
- More than 700 volunteers around the world

the island is urbanized), and it is famous as the home of the Japanese crested ibis, or "Toki" (in Japanese). The main industries on the island -- which has a population of approximately 65,000 -- are agriculture, forestry and fisheries, construction, and tourism.

TAG
—
Municipal Government , Newsletter More

RECENT ARTICLES

2010.10.18 Mon
Environmental 'Green Float' Island City to Float in Equatorial Pacific Ocean Technology
One of the largest general contractors in Japan, Shimizu Corporation, announced on May 10, 2010, plans for promoting the research and...

2010.10.17 Sun
Ito-Yokado to Expand Closed-Loop Agriculture by Seven Farm Food/Water
Ito-Yokado Co., a major Japanese retailer, announced on March 19, 2010, that it will establish a core business in the agricultural se...

2010.10.16 Sat
Four More Global Companies Join Smart City Project Ecosystem
The Future Design Center Incorporated Association (FDC) in Japan announced on June 4, 2010, that four more companies are participating in...

POPULAR ARTICLES

- > Kawasaki Plant Systems Wins Build-Operate Contract for Waste Incineration & Biogas Generation Complex
- > Sandwich Chain Opens World's First Shop with Onsite Lettuce Factory
- > Sewage pipes directly connect the home and the environment
- > Compost Reduces Waste and Produces Flowers
- > Closed-loop Recycling Project of School Gym Uniforms Launched in Kyoto

RECENT ARTICLES

- > [Newsletter] Transforming Agriculture and Economy to Save the Japanese Crested Ibis: Sado Island
- > Environmental 'Green Float' Island City to Float in Equatorial Pacific Ocean
- > Ito-Yokado to Expand Closed-Loop Agriculture by Seven Farm
- > Four More Global Companies Join Smart City Project
- > City of Kyoto Shifting from 'Car-Centric' into Being a 'Walking City'

KEYWORDS

- > Energy
- > Transportation
- > Material reduction
- > Global warming
- > Ecosystem
- > Food/Water
- > Chemicals
- > Eco-product/ Business
- > Technology
- > System
- > Other
- > Government
- > Local government
- > University/ Research Institute
- > Manufacturing industry
- > Non-manufacturing industry
- > NGO/Citizen
- > All

MENU

- > About us
- > Join
- > Mail Magazine
- > Contact

EcoNetworks, Co.

- A team of specialists in the environment, business, and languages
- Networks spreads over 100 countries

The screenshot shows the EcoNetworks website homepage. At the top left is the EcoNetworks logo, a stylized infinity symbol. To its right is the text "Team Sustainability" and a description: "We are a team of specialists in the environment, business, and languages, and our networks spans more than 100 countries." Below the logo are navigation buttons for "Contact Us", "Feed", and "日本語". A secondary navigation bar includes "Home", "About", "Services", "Associates", and "News".

The main content area is divided into several sections:

- Services:** A section with the text "We produce content and offer system development services, to help move toward sustainable society." followed by three small images of people.
- CSR Consulting:** A section titled "How can an organization incorporate and embody sustainability?" with a paragraph of text and a "More Details" link.
- Communications Support:** A section titled "Are your communications really effective? Are you inspiring your stakeholders?" with a paragraph of text and a "More Details" link.
- Recent News:** A section with two news items: "[Reminder]Eco-Products 2011 Exhibition Multilingual Tour and Live Facebook updates" and "Miracle Miracle* Preliminary Launched!".
- TEAM SUSTAINABILITY:** A section with a graphic and the text "We are Team Sustainability. We work to change ourselves and our society and move toward sustainability."
- ENW Concept Presentation:** A section with the text "We are a team of specialists in the environment, business, and languages, and our network spans the world."
- [Project] Panasonic ecoideasnet:** A section with the text "ecoideasnet" will keep bringing you

At the bottom right, there is a Facebook widget showing the EcoNetworks Co. profile, including a "Like" button and a photo of people on scooters.

Goal

Imagine that we are holding “SDGs (Sustainable Development Goals) Dialogue” in this room.

You should be able to present the followings;

- what is sustainability (with your own terms)
- what is 1. your vision and goals, 2. indicators, 3. policies for country/
region/global society.
(with your own logic)

Plan

11/19

- Session 1. - What is sustainability?
- countries and int'l communities
 - measurement and tracking

- Session 2. - vision
- indicators and policy => Workshop

11/26

- Session 1. - Group work & Presentation

- Session 2. - Discussion
- Latest policy framework

Session 1

- Communication exercise

1) What is Sustainability?

(Background and Definitions)

2) How are we responding?

(National/International strategies and indicators)

3) How do we measure and track it?

Communication First

- Why communication first?
- As ...
 - An Engineer
 - Research Proposal / Budget
 - A Policy Maker
 - Different countries and interests
 - A Business Person
 - 80-90% of the time

Communication Exercise

“Date Game”

Your name/ country/ home town	Research interest
Your “personal” eco/sustainability policy	What you would write about on JFS newsletter

Prep: 5 minutes

Communicate: 15 minutes

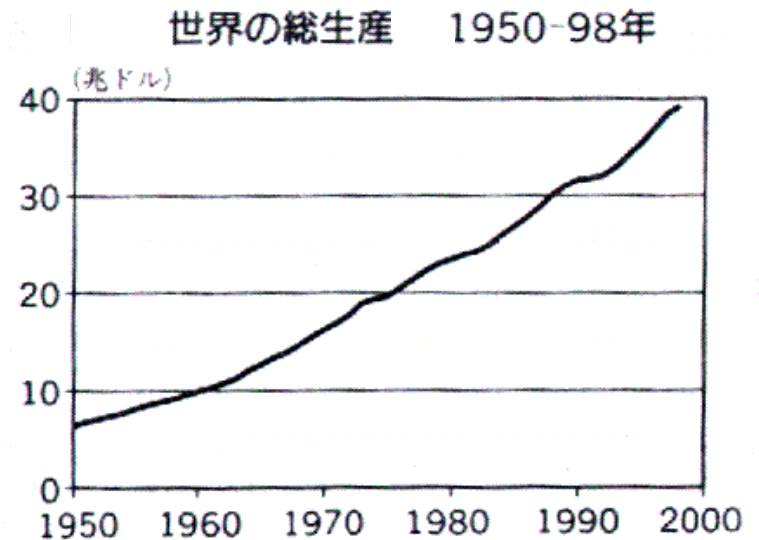
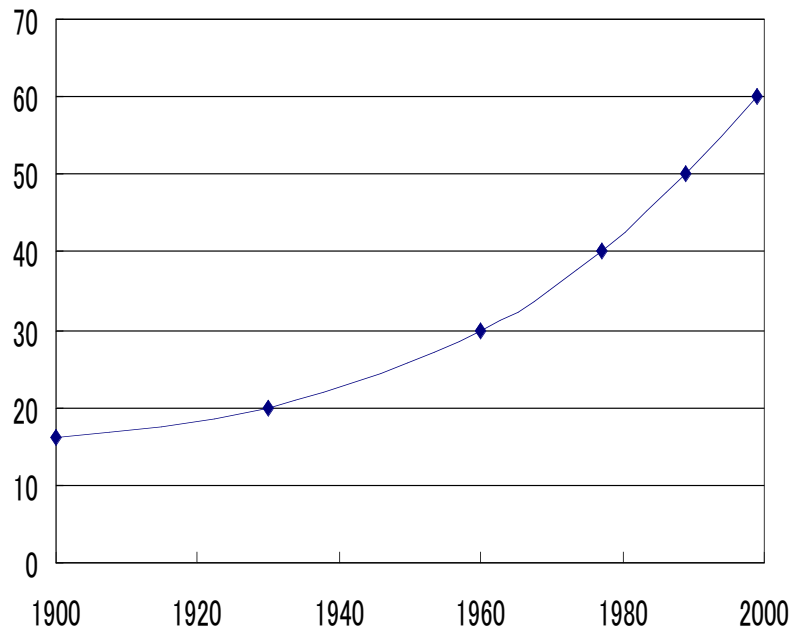
1) What is sustainability?
(Background and definitions)

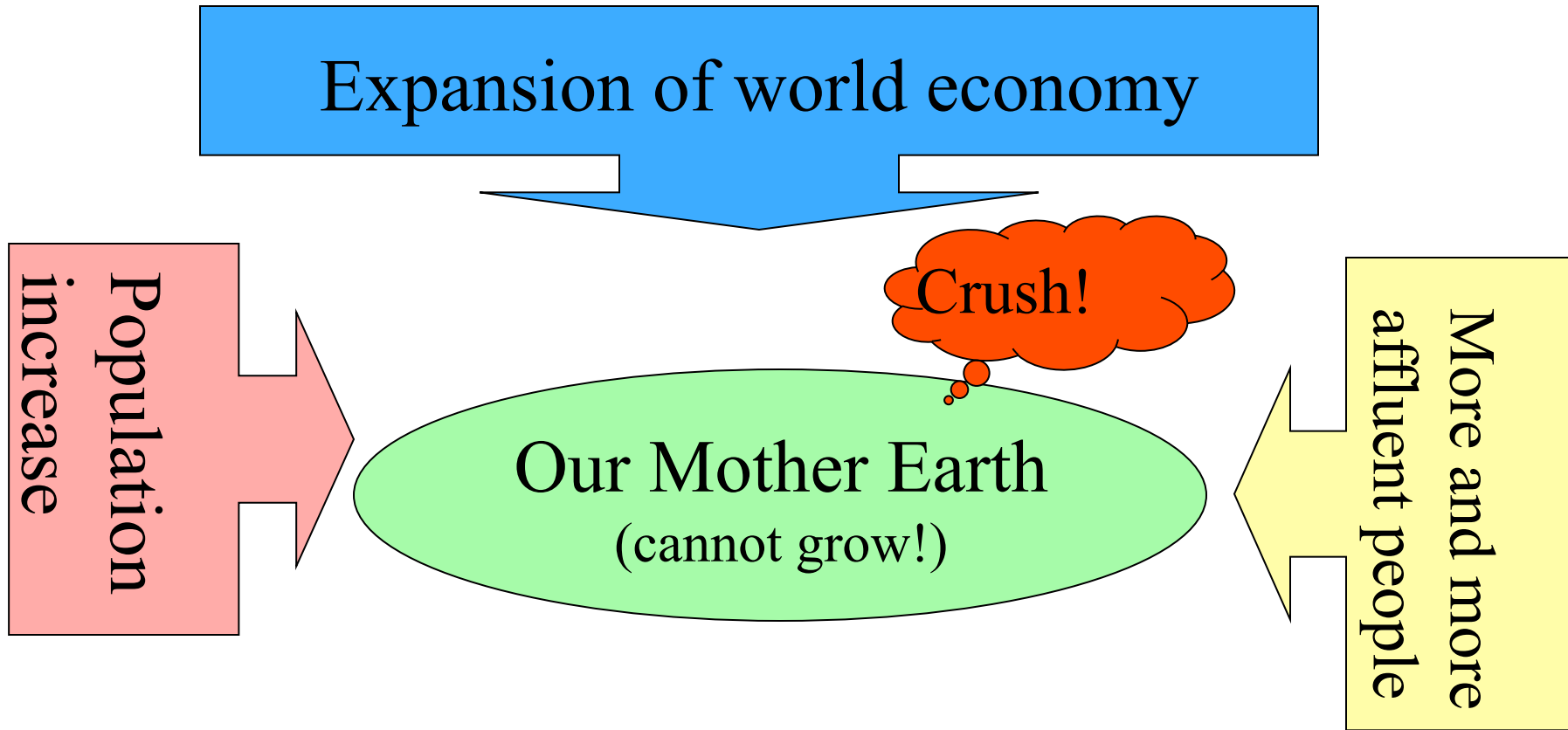
Background: Root causes of global environmental crisis

Population



World Economy



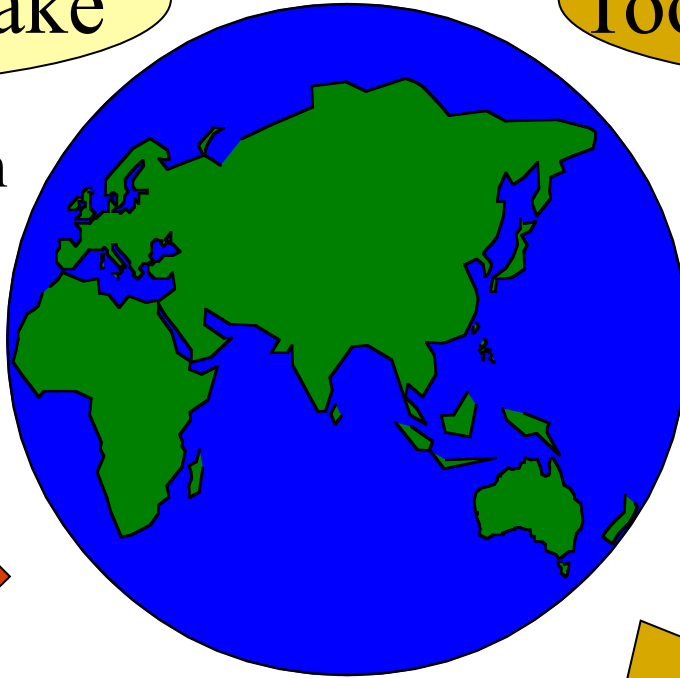
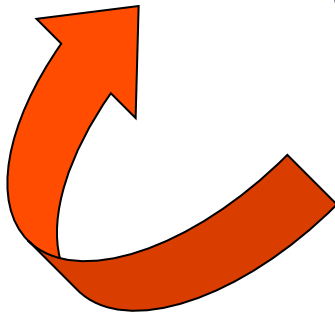


$$\text{Impact} = \text{Population} \times \text{Affluence} \times \text{Technology}$$

Root causes are...

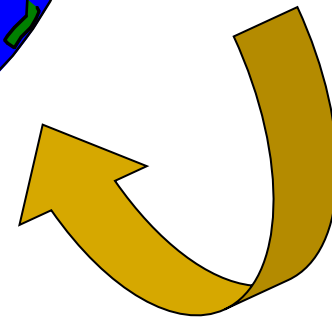
Too much intake

- Resource depletion
- Lowing aquifers
- Shrinking forests



Too much emission

- CO₂/ GHGs
- Wastes
- Toxic Substances
- NO_x, SO_x...



“If everyone lived as we do in the UK we’d need three planets to support us.”

What is Sustainability?

Webster's New International Dictionary

"Sustain - to cause to continue (as in existence or a certain state, or in force or intensity); to keep up, especially without interruption diminution, flagging, etc.; to prolong."

Webster's New International Dictionary.

(Springfield, Mass.: Merriam-Webster Inc., 1986)

What is Sustainability?

Our Common Future

"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

Page 8, *World Commission on Environment and Development. Our Common Future.* (Oxford, Great Britain: Oxford University Press, 1987). (Frequently referred to as the Brundtland report after Gro Harlem Brundtland, Chairman of the Commission)

What is Sustainability?

World Business Council on Sustainable Development

"Sustainable development involves the simultaneous pursuit of economic prosperity, environmental quality and social equity. Companies aiming for sustainability need to perform not against a single, financial bottom line but against the triple bottom line."

What is Sustainability?

World Business Council on Sustainable Development (cont.)

"Over time, human and social values change. Concepts that once seemed extraordinary (e.g. emancipating slaves, enfranchising women) are now taken for granted. New concepts (e.g. responsible consumerism, environmental justice, intra- and inter-generational equity) are now coming up the curve."

<http://www.wbcsd.ch/>

What is Sustainability?

Interfaith Center on Corporate Responsibility (ICCR)

"Sustainable development...[is] the process of building equitable, productive and participatory structures to increase the economic empowerment of communities and their surrounding regions.

Interfaith Center on Corporate Responsibility

What is Sustainability?

Jerry Sturmer

**Santa Barbara South Coast Community
Indicators**

“Sustainability is meeting the needs of all humans, being able to do so on a finite planet for generations to come while ensuring some degree of openness and flexibility to adapt to changing circumstances.”

JSturmer@aol.com

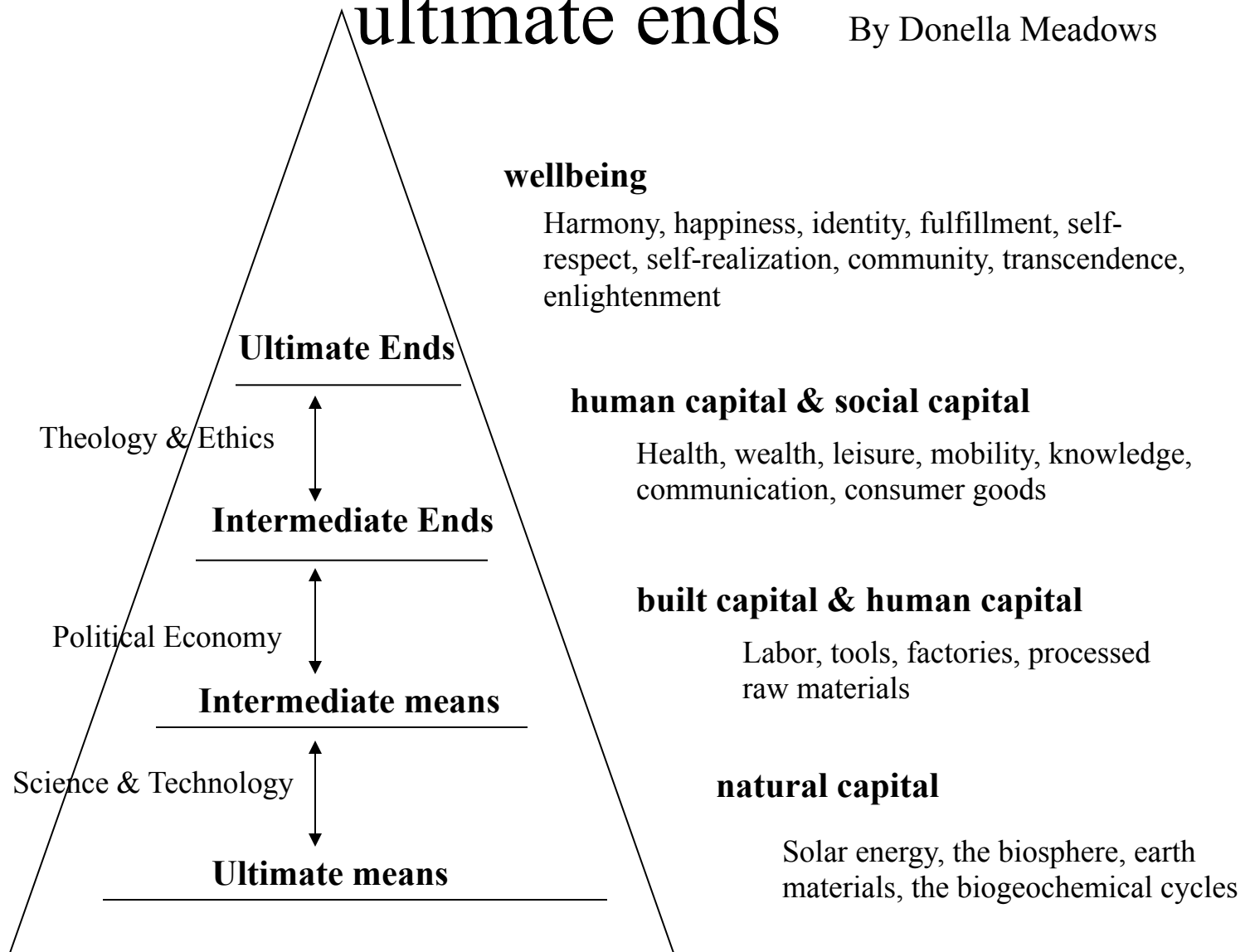
What is Sustainability?

The Native American Iroquois Confederacy

"seventh generation" philosophy mandating that chiefs always consider the effects of their actions on their descendants through the seventh generation in the future.

Hierarchy from ultimate means to ultimate ends

By Donella Meadows



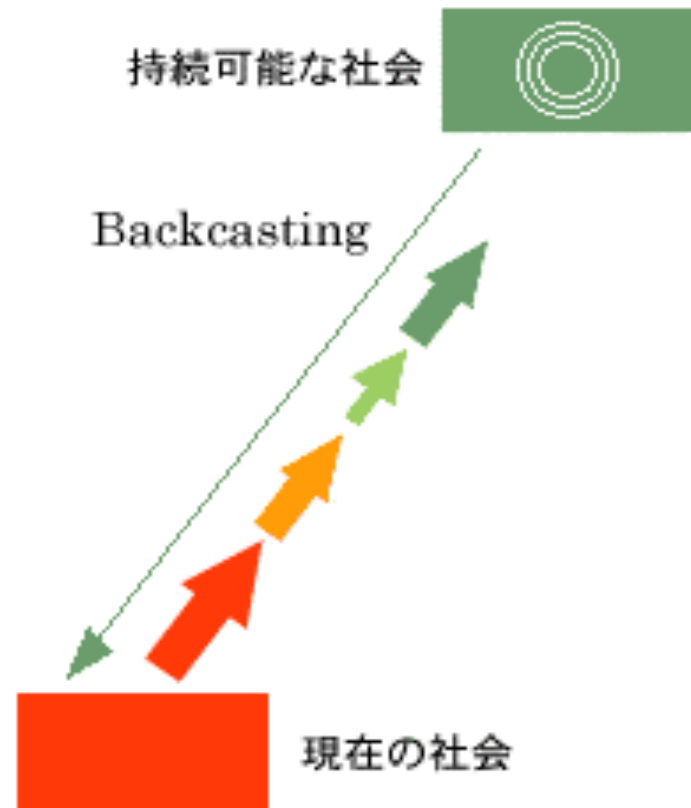
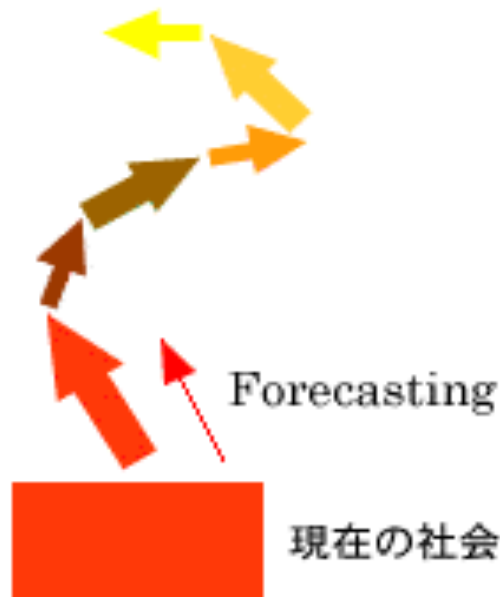
Source: <http://www.sustainabilityinstitute.org/pubs/Indicators&Information.pdf>

Now what?

Vision and Backcasting

フォアキャスティング手法

バックキャスティング手法



Rio+20 UN Conference on Sustainable Development (2012/6)

- Global environment summit – once a decade
- Non-binding declaration

Set out

- Green Economy : definition left to each country
- Sustainable Development Goals

Left out

- Specific details and goals
- Universal energy access and doubling renewable energy by 2030

pledges

- Scandinavian leaders pledged support for systems that would place an economic value on clean waterways, intact forests and other important ecosystems
- Grenada transport and electricity sectors will only use clean energy sources by 2030
- Unilever cut its greenhouse gas emissions in half by 2020 and find sustainable sources of beef, soy and palm oil to prevent the deforestation now stemming from production of these three major crops.

Copenhagen Accord (2009/12)

- not legally binding
- agrees cooperation in peaking (stopping from rising) global and national greenhouse gas emissions "as soon as possible" and that "a low-emission development strategy is indispensable to sustainable development"

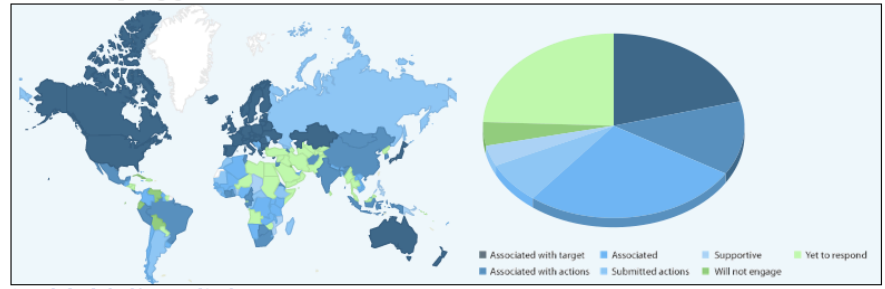


Different responsibilities

Developed Countries:

- "commit to economy-wide emissions targets for 2020"
- raise funds of \$30 billion from 2010-2012 of new and additional resources

























Interactive Map: Engagement with Accord



Developing Countries:

- "implement mitigation actions" (Nationally Appropriate Mitigation Actions) to slow growth in their carbon emissions
- report those actions once every two years
- specially these with low-emitting economies should be provided incentives to continue to develop on a low-emission pathway

Examples of “commitment”

	Country	Date	Reported Statements	Engagement with Accord	Reduction by 2020	Reduction Base Year	Reduction Type	On 1990 Scale (+/-)	Share of World's Total GHGs ¹	CO ₂ Emissions per capita (tCO ₂ eq) ¹	Source
	China	1/29 2010	nationally appropriate mitigation actions and a letter indicating association. Also submitted additional information saying "China highly commends and supports the Copenhagen Accord." Read more	Associated with actions	40 to 45%	N/A		See Note⁹	16.64%	5.5	 UNFCCC
	United States	1/28 2010	Formally submitted letter to the United Nations indicating association and submitted an economy-wide emissions reduction target. Read more	Associated with target	17%	2005		-3.67%⁸	15.78%	23.1	 UNFCCC
	European Union (EU-27)	1/27 2010	Formally submitted letter to the United Nations indicating association and submitted an economy-wide emissions reduction target. Read more	Associated with target	20% / 30%	1990		-20% / -30%	11.69%	10.3	 UNFCCC
	Brazil	12/29 2009	Formally submitted letter to the United Nations indicating association and submitted nationally appropriate mitigation actions. Read more	Associated with actions	36.1 to 38.9%	N/A		+6.4 to +1.7%²	6.6%	15.3	 UNFCCC
	Russian Federation	2/1 2010	Submitted an economy-wide emissions reduction target. Read more	Submitted target	15 to 25%	1990		-15 to -25%	4.64%	14.0	 UNFCCC
	India	1/29 2010	Formally submitted letter to the United Nations indicating association and submitted nationally appropriate mitigation actions. Read more	Associated with actions	20% to 25%	2005		See Note¹⁰	4.32%	1.7	 UNFCCC
	Japan	1/26 2010	Formally submitted letter to the United Nations indicating association and submitted an economy-wide emissions reduction target. Read more	Associated with target	25%	1990		-25%	3.14%	10.6	 UNFCCC
	Maldives	1/29 2010	Formally submitted letter to the United Nations indicating association and submitted nationally appropriate mitigation actions. Read more	Associated with actions	100%	2009		-100%	0.00%	2.5	 UNFCCC

Issues by Area

各エリア別社会課題一覧

作成:小林一紀 (Feb, 2012)

Area	出典	環境の持続可能性	教育	雇用・労働	貧困・格差	医療・健康	少子高齢化	ジェンダー・人権
North America	OECD "US Country Reviews"	(欧州と同様の課題あり)	(欧州と同様の課題あり)	雇用	経済格差	肥満 健康支出	(人口増加)	(ダイバーシティは課題)
Europe	欧州委員会"欧州2020"	気候変動 エネルギー	教育 (退学、高等教育)	雇用	貧困・社会的排除		(課題あり)	(ダイバーシティは課題)
China	UNDP "中国におけるMDGsの進捗状況(2010)"	環境の持続可能性	(小学校は普及)			HIV/AIDSほか疾病 妊産婦の健康		(「東アジア」は課題あり)
	中国政府 "第12次5カ年計画"	資源節約・環境保護型 社会への転換		労働争議	均衡のとれた開発 分配の公平性	(栄養不足と肥満)		(進捗あり)
	(参照) 三井物産研究所 "第12次5カ年計画が始動した中国"	エネルギー問題					少子高齢化	
South East Asia	国連 "Millennium Development Goals: 2011 Progress Chart"	環境の持続可能性	初等教育の普及	(課題あり)	貧困と飢餓	HIV/AIDSほか疾病乳幼児死亡率 妊産婦の健康	(国による)	ジェンダー平等

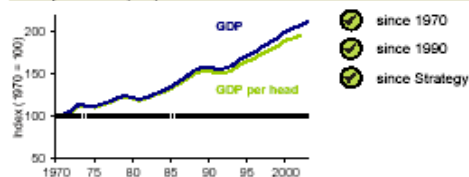
Strategies for sustainability?

NO.	事例	国名	概要
1	持続可能な開発指標	イギリス	15のヘッドライン指標の最新データをグラフでわかりやすく表示。2008年の更新では20主要指標に拡充。
2	国家持続性戦略	ドイツ	「世代間の公平性」「生活の質」「社会的まとまり」の3分野で21の数値目標を設定
3	持続可能な開発指標	スウェーデン	「持続可能なコミュニティ」「平等の健康」「人口問題への対応」「持続可能な成長」の4つの戦略のもと、12のヘッドライン指標、99の指標を設定
4	持続可能な開発のモニタリングシステム	スイス	持続可能な開発に関する社会、経済、環境のデータベース。 ※ドイツ語、フランス語のみ
5	持続可能な開発指標	フィンランド	「世代間の公平性」「世界的責任」など8つのカテゴリーで64の指標を設定。毎年更新されている。
6	国家持続可能な開発戦略	デンマーク	主要な指標として、8つの基本原則のもと、14の指標を設定。その他、気候変動、生態系保全などの各分野で指標を設けている。
7	環境と持続可能な開発指標	カナダ	自然資本を中心とした6つの指標(大気環境、水環境、温室効果ガス、森林被覆、湿地、学業成績)を設定。
8	持続性指標	オーストラリア	持続可能な開発の国家戦略として、24の指標を設定。
9	国家持続可能な開発戦略	オーストリア	20の基本方針のもと、48の指標が定められている。※ドイツ語
10	持続可能な開発指標	アメリカ合衆国	社会、経済、環境にわけ、それぞれ「長期的な資源と負債」「経過」「現状の結果」の3種類で計39の指標を設定
11	持続可能な開発全国指標	フランス	※フランス語のみ

UK headline indicators

H1 ECONOMIC OUTPUT

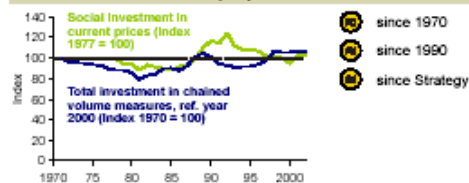
GDP per head (UK)



- 27% increase in real GDP per head between 1990 and 2002, 2.0% per year on average.
- Real GDP per head increased by 1.4% in 2002, and has increased by 9% since 1998.

H2 INVESTMENT

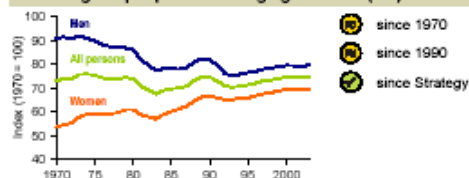
Total & Social Investment (UK)



- Total real investment relative to GDP rose from 16.3% in 1990 to 17.2% in 1998, and was 17.2% in 2002.
- Social investment (railways, hospitals, schools etc.) was around 2% of GDP in 1990 and 1.7% in 2002 (only available on a current price basis).

H3 EMPLOYMENT

Percentage of people of working age in work (UK)



- The percentage of working age people in work was 74.7% in 2003 – the same as in 1990.
- The percentage for 2003 was 0.3 percentage points up on 2002 and was an increase on the 1999 figure of 73.9%.

H4 POVERTY AND SOCIAL EXCLUSION

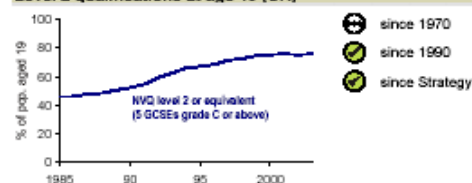
Selected indicators of poverty & social exclusion



- 11.5% of working age people were in workless households in 2003, reduced from 12.8% in 1998; 14.8% were without qualifications, down from 16.7 in 1999.
- 28% of children were in relatively low-income households (after housing costs) in 2002-3, reduced from 34% in 1996-7.
- 26% of single elderly households experienced fuel poverty in 2001, reduced from 77% in 1991 and 61% in 1996.

H5 EDUCATION

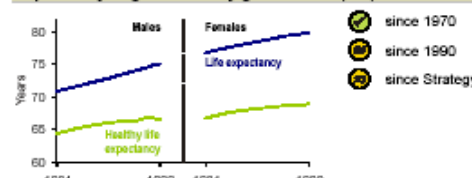
Level 2 qualifications at age 19 (UK)



- In 2003, 76.1% of 19 year-olds achieved NVQ level 2 or equivalent (5 GCSEs grade C), up from 52% in 1990, and 74.5% in 1999. The 2003 figure was the same as that for 2001 (the previous highest level).

H6 HEALTH

Expectancy of good or fairly good health (GB)



- Between 1990 and 1999 healthy life expectancy increased only slightly, from 66.1 to 66.6 years for men and from 68.3 to 68.9 years for women.
- Overall life expectancy (75.1 years for men, 80.0 years for women) has increased more than healthy life expectancy, so an increasing proportion of those extra years are in poor health.

H7 HOUSING CONDITIONS

Households in non-decent housing (England)



- Between 1996 and 2001, non-decent housing fell from 52% to 38% and from 45% to 32% in the social and private sectors, respectively.
- Between 1991 and 1996 there was no significant change across a broad range of condition measures. As housing conditions have changed for the better since 1990, the overall assessment is that there has been an improvement since 1990.

H8 CRIME

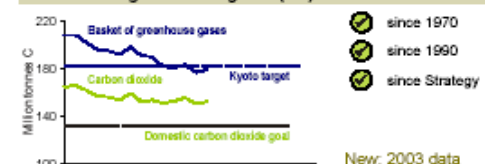
Recorded crime (England & Wales)



- Both the British Crime Survey and recorded crime show that burglary and vehicle crimes fell substantially from the early 1990s: from 1990 such recorded crimes fell by 17% and 23% respectively (BCS indicates falls from 1991 of 29% and 38%).
- By 2002-3, recorded robbery had risen to 108,000 from 67,000 in 1998-9 but was 11% lower than the previous year.

H9 CLIMATE CHANGE

Emissions of greenhouse gases (UK)



- Emissions of the 'basket' of six greenhouse gases (on which progress is assessed) fell by 12% between 1990 and 2001, and provisionally by 14% between 1990 & 2003.
- CO₂ emissions for 2003 were provisionally 7% lower than in 1990 but rose by about 1.5% between 2002 and 2003.

H10 AIR QUALITY

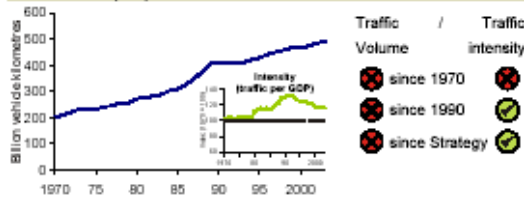
Days when pollution is moderate or higher (UK)



- Owing to an unusually hot summer 50 days in 2003 had moderate or higher air pollution on average at urban sites – down from 59 days in 1993 but up from 20 days in 2002.
- Rural air quality was relatively poor for 61 days in 2003 compared with 50 in 1990, but is highly dependent on the weather and there is no clear overall trend.

H11 ROAD TRAFFIC

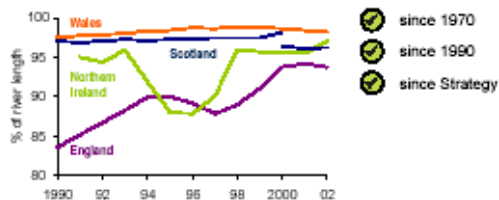
Road traffic (GB)



- Between 1990 and 2003, road traffic volume increased by 20% from 411 to (provisionally) 493 billion vehicle kilometres.
- Road traffic intensity (vehicle kilometres per GDP) fell by 11% between 1990 and 2003. This shows that, whilst traffic volumes have continued to rise, the historical link between road traffic and economic growth is weakening.

H12 RIVER WATER QUALITY

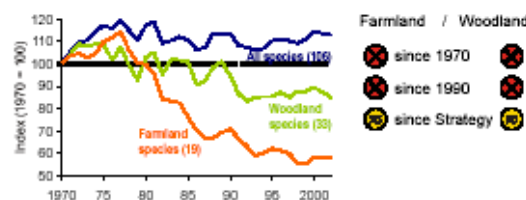
Rivers of good or fair chemical quality (UK)



- In 2002 94% of UK river lengths were of good or fair chemical quality. A similar proportion were of good or fair biological quality (not shown), with 68% of good quality.
- There have been significant improvements in English rivers for both chemical and biological quality.

H13 WILDLIFE

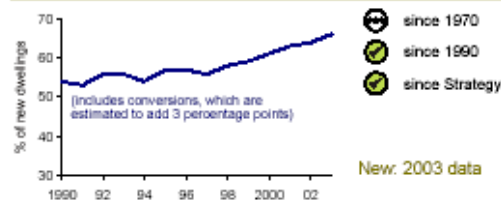
Populations of wild birds (UK)



- The index of farmland bird populations has nearly halved since its 1977 peak and has fallen by 18% since 1990, but has remained at about the same level over the last four years.
- The woodland bird index fell by 29% between its 1974 peak & 1998 since when it has remained roughly constant.

H14 LAND USE

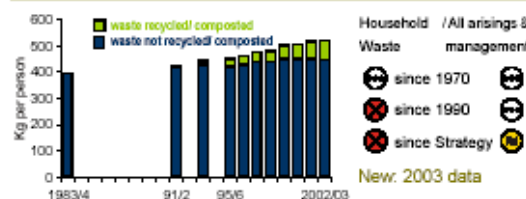
Homes built on previously developed land (England)



- In 2003, 66% of new dwellings were provided on previously developed land and through conversions, up from around 54% in the early 1990s.

H15 WASTE

Household waste (England & Wales)



- Household waste is about a sixth of all controlled waste. Between 1991-2 and 2002-3, the amount not recycled or composted increased by 7% from 417 to 446 kg per person. However, the percentage recycled or composted increased from 3% to 14% in the same period and in 2002-3 the amount not recycled fell for the first time in recent years.
- In 1998-9 UK households, commerce and industry produced about 195 million tonnes of waste (not shown). About 50% of this went to landfill. Estimated figures for 2000-1 suggest the total amount of waste was 220 million tonnes, with 45% going to landfill. (These changes are not statistically significant.)

Quality of Life Barometer

Updated June 2004



Sustainable development is about ensuring a better quality of life for everyone, now and for generations to come.

The 15 Headline indicators of sustainable development – a quality of life barometer – provide an overview of progress in meeting the objectives of the UK Sustainable Development Strategy – *A better quality of life* (May 1999).

Headline indicators – assessment of progress

	since 1990	since Strategy
Economic output	⊕	⊕
Investment	⊕	⊕
Employment	⊕	⊕
Poverty & social exclusion	⊕	⊕
Education	⊕	⊕
Health	⊕	⊕
Housing - conditions	⊕	⊕
Crime - robbery	⊖	⊖
- vehicle & burglary	⊕	⊕
Climate change	⊕	⊕
Air quality	⊕	⊕
Road traffic - total traffic volumes	⊖	⊖
- traffic per GDP	⊕	⊕
River water quality	⊕	⊕
Wildlife - farmland birds	⊖	⊖
- woodland birds	⊕	⊕
Land use	⊕	⊕
Waste - household waste	⊖	⊖
- all arisings & management	⊖	⊖

Key:

Significant change, in direction of meeting objective

No significant change

Significant change, in direction away from meeting objective

Insufficient or no comparable data

Where a trend is unacceptable, the government will adjust its policies, and look to others to join it in taking action. A full assessment of progress can be found in the fourth Government Annual Report on Sustainable Development 2003: *Achieving a better quality of life*. Data and further details on the Headline and a wider core set of indicators are available on the website below.

www.sustainable-development.gov.uk

For additional copies of this leaflet, please call 020 7082 8621

Measuring progress 2010

Key indicators

The twenty key indicators in the table below are selected to provide an overview of some of the important goals for sustainable development.

Indicator number and title	Change since 1990 ¹	Change since 2003	Direction in latest year*
1. Greenhouse gas emissions	☑	☑	✓
13. Resource use	☑	☑	✓
18. Waste arisings	☹	☑	✓
20. Bird populations	Farmland	☹	✓
	Woodland	☹	✓
	Seabird	☹	≈
27. Fish stocks sustainability	☑	☑	✓
28. Ecological impacts of air pollution	Acidity	☹	...
	Nitrogen	☹	...
30. River quality	Biological	☹	≈
	Chemical	☑	✓
32. Economic output	☑	☑	✗
37. Active community participation	☹	☹	✗
38. Crime	☑ <small>1991</small>	☑	✓
40. Employment	☹	☹	✗
41. Workless households	☹	☹	✗
43. Childhood poverty	Before housing cost	☑	✓
	After housing cost	☹	
45. Pensioner poverty	Before housing cost	☑	✓
	After housing cost	☑	✓

¹ Year as shown if not 1990

Indicator number and title	Change since 1990 ¹	Change since 2003 ²	Direction in latest year*
47. Educational attainment	☑	☑ <small>2004</small>	✓
49. Health inequality	Infant mortality gap <small>1994</small>	☑	✓
	Life expectancy gap <small>1991</small>	☹	✗
55. Mobility	Walking / cycling <small>1995-7</small>	☹	✓
	Public transport use <small>1995-7</small>	☑	≈
59. Social justice	☹	☹	☹
60. Environmental equality	☹	☹	☹
68. Wellbeing	☹	☹	☹









¹ Year as shown if not 1990 ² Year as shown if not 2003

- ☑ = clear improvement since base year
- ☹ = little or no change since base year
- ☹ = clear deterioration since base year
- ☹ = insufficient or no comparable data

*The third column, *Direction of change in latest year* (comparing the latest and penultimate years for which data are available) is provided to give an indication only and may not represent a clear improvement or deterioration. Indication of change is based on a 1 per cent threshold over which change in the indicator value was deemed to warrant a tick or cross. Exceptions are where recent figures are known not to represent a genuine change owing to methodological issues.

Germany

Our Strategy for Sustainable Development

No.	Indicator areas Sustainability axiom	Indicators	Goals	Status
I. Intergeneration equity				
1a	Resource protection <i>Using resources economically and efficiently</i>	Energy productivity	Doubling between 1990 and 2020	
1b		Raw material productivity	Doubling between 1994 and 2020	
2	Climate protection <i>Reducing greenhouse gases</i>	Greenhouse gas emissions	Reduction of 21 % compared to 1990 until 2008/2012	
3a	Renewable energies <i>Strengthening a sustainable energy supply</i>	Share of renewable energy sources in total primary energy consumption	Increase to 4.2 % by 2010 and to 10 % by 2020	
3b		Share of renewable energy sources in electricity consumption	Increase to 12.5 % by 2010 and to at least 30 % by 2020	
4	Land use <i>Sustainable land use</i>	Increase in land use for housing and transport	Reduction in daily increase to 30 hectares by 2020	
5	Species diversity <i>Conserving species – protecting habitats</i>	Species diversity and landscape quality	Increase to the index value 100 by 2015	
6	National debt <i>Consolidating the budget – creating intergeneration equity</i>	National deficit	Structurally balanced public spending; Federal budget without net borrowing from 2011 at latest	



The target value of the indicator has been achieved or the remaining 'distance' would be covered by the target year (deviation less than 5%).



The indicator is developing in the right direction, but if the annual trend continues unaltered there will still be a gap of between 5 and 20% which will need to be covered to reach the target value in the target year.



The indicator is developing in the right direction, but if the annual trend continues unaltered there will still be a gap of more than 20% which will need to be covered to reach the target value in the target year.

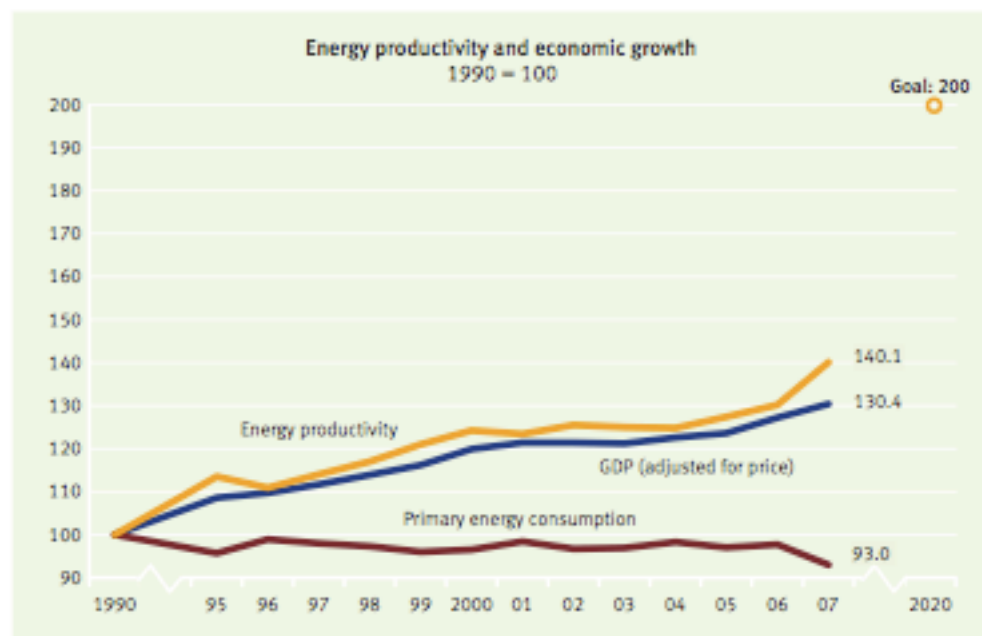


The indicator has developed in the wrong direction and if the annual trend continues unaltered the distance to be covered to reach the goal would become even greater.

I. Intergeneration equity

Resource Protection

Using resources economically and efficiently



Source: Federal Statistical Office, Working Group on Energy Balances (AGEB)

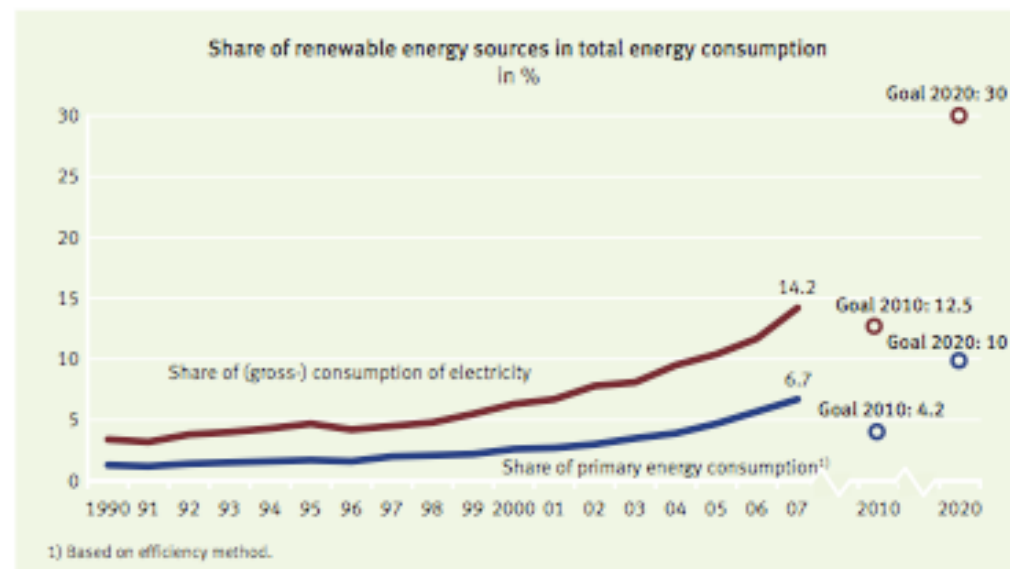
1a Energy productivity

The use of energy occupies a key position in the economic process because almost every production activity is either directly or indirectly associated with the consumption of energy. Private households use energy particularly for heating their homes and water, using electrical appliances as well as to run motor vehicles. The consumption of energy has a number of environmental effects, such as a detrimental impact on landscapes, ecological systems, the soil, water bodies and ground water due to the depletion of natural energy resources, emissions of harmful substances and greenhouse gas emissions with an effect on climate, the production of waste as well as the use of cooling water involved in converting and consuming energy sources. And, last but not least, the consumption of non-renewable resources is of special importance with regard to safeguarding the livelihood of future generations.

The Sustainability Strategy of the Federal Government takes into consideration the major importance of energy, both from an economic and environmental perspective,

Renewable energies

Strengthening a Sustainable Energy Supply








Source: Working Group on Renewable Energies – Statistics (AGEE-Stat), Working Group on Energy Balances (AGEB), Zentrum für Sonnenenergie- und Wasserstoffforschung Baden-Württemberg (ZSW) (Centre for Solar Energy and Hydrogen Research Baden-Württemberg), Federal Ministry for the Environment, Nature Conservation and Nuclear Safety; June 2008

3a,b Share of renewable energy sources in total energy consumption









The reserves of important fossil energy sources such as oil and gas are limited, and their use is associated with greenhouse gas emissions. The goal of the Sustainability Strategy is therefore to promote the development of renewable sources of energy. Renewable sources of energy are energy sources which can be derived from natural processes which are constantly regenerated. Renewable energies include hydro-power, wind power, solar energy and geothermal energy, but also biomass such as firewood and the biodegradable portions of domestic refuse.







The development of the use of renewable energy is measured in the Sustainability Strategy by means of the indicators 'Share of renewable energy in total primary energy consumption' and 'Share of electrical power from renewable sources in total power generation'. The aim of the Federal Government is to increase the share of renewable energy in primary energy consumption to 4.2% and the share in elec-

Contin.


No.	Indicator areas Sustainability axiom	Indicators	Goals	Status
7	Provision for future economic stability <i>Creating favourable investment conditions – securing long-term prosperity</i>	Gross fixed capital formation in relation to gross domestic product (GDP)	Increase in the share	
8	Innovation <i>Shaping the future with new solutions</i>	Private and public spending on research and development	Increase to 3 % of GDP by 2010	
9a	Education and training <i>Continuously improving education and vocational training</i>	18- to 24-year-olds without a school leaving certificate	Reduction in proportion to 9 % by 2010 and 4,5 % by 2020	
9b		25-year-old university graduates	Increase in proportion to 10 % by 2010 and 20 % by 2020	
9c		Share of students starting a degree course	Increase to 40 % by 2010, followed by further increase and stabilisation at a high level	





II. Quality of life

10	Economic prosperity <i>Raising economic output by environmentally and socially compatible means</i>	Gross domestic product per capita	Economic growth	
No.	Indicator areas Sustainability axiom	Indicators	Goals	Status
11a	Mobility <i>Guaranteeing mobility – protecting the environment</i>	Intensity of goods transport	Reduction to 98 % in comparison to 1999 by 2010 and to 95 % by 2020	
11b		Intensity of passenger transport	Reduction to 90 % in comparison to 1999 by 2010 and to 80 % by 2020	
11c		Share of rail transport in goods transport performance	Increase to 25 % by 2015	
11d		Share of inland water transport in goods transport performance	Increase to 14 % by 2015	
12a	Farming <i>Environmentally sound production in our cultivated landscape</i>	Nitrogen surplus	Reduction to 80 kg/hectare on land used for agriculture by 2010, further reduction by 2020	
12b		Organic farming	Increase of the share of organic farming on land used for agriculture to 20 % in coming years	
13	Air quality <i>Keeping the environment healthy</i>	Air pollution	Reduce to 30 % compared to 1990 by 2010	

No.	Indicator areas Sustainability axiom	Indicators	Goals	Status
14a	Health and nutrition <i>Living more healthily for longer</i>	Premature mortality (cases of death per 100,000 residents under 65) men	Reduction to 190 cases per 100,000 by 2015	
14b		Premature mortality (cases of death per 100,000 residents under 65) women	Reduction to 115 cases per 100,000 by 2015	
14c		Proportion of adolescents who smoke (12- to 17-year-olds)	Decrease to under 12 % by 2015	
14d		Proportion of adults who smoke (15 years and older)	Decrease to under 22 % by 2015	
14e		Proportion of obese people (adults, 18 and older)	Reduction by 2020	
15	Crime <i>Further increasing personal security</i>	Burglaries in homes	Reduction in cases to under 100,000/year by 2015	

III. Social cohesion

16a	Employment <i>Boosting employment levels</i>	Employment rate (total) (15- to 64-year-olds)	Increase to 73 % by 2010 and 75 % by 2020	
16b		Employment rate (older people) (55- to 64-year-olds)	Increase to 55 % by 2010 and 57 % by 2020	

No.	Indicator areas Sustainability axiom	Indicators	Goals	Status
17a	Perspectives for families <i>Improving the compatibility of work and family life</i>	All-day care provision for children (0- to 2-year-olds)	Increase to 30 % by 2010 and 35 % by 2020	
17b		All-day care provision for children (3- to 5-year-olds)	Increase to 30 % by 2010 and 60 % by 2020	
18	Equal opportunities <i>Promoting equal opportunities in society</i>	Wage difference between women and men	Reduce the difference to 15 % by 2010 and to 10 % by 2020	
19	Integration <i>Integration instead of exclusion</i>	Foreign school leavers with a school leaving certificate	Increase in the proportion of foreign school leavers with at least Hauptschule certificate and alignment with quota for German school leavers by 2020	

IV. International responsibility

20	Development cooperation <i>Supporting sustainable development</i>	Share of expenditures for official development assistance in gross national income	Increase to 0.51 % by 2010 and 0,7 % by 2015	
21	Opening markets <i>Improving trade opportunities for developing countries</i>	German imports from developing countries	Further increase	

18 Wage difference between women and men

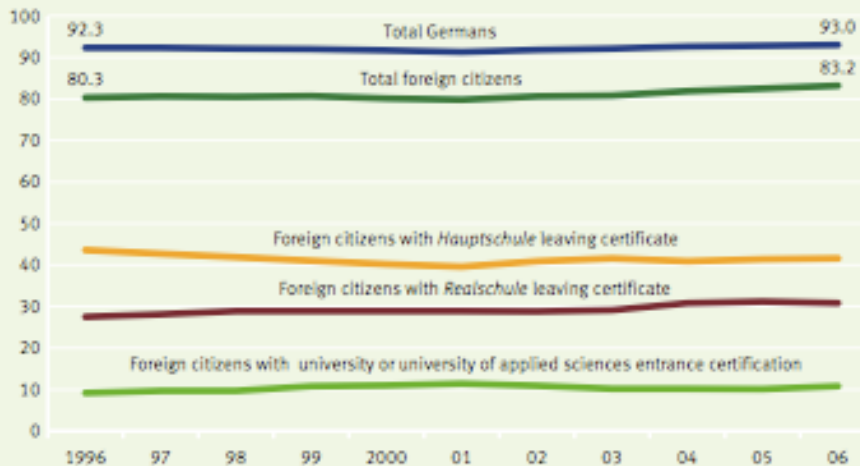
Difference between average gross hourly wages of women and men in % of men's earnings¹⁾



¹⁾ Because of a change in the data source in 2002, the gender-specific wage differences could have increased by one percentage point.

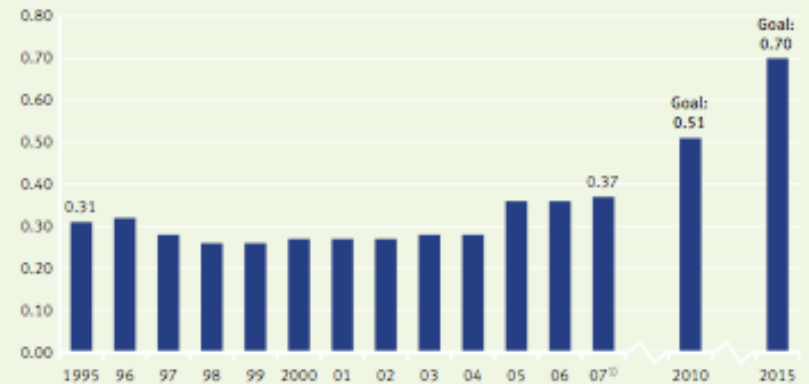
19 Foreign school leavers with a school leaving certificate

General school leavers with a school leaving certificate in % of all school leavers by year



20 Share of expenditures for official development assistance in gross national income

Share of expenditures for official development assistance (ODA¹⁾ in gross national income (%)



¹⁾ Provisional figures for 2007.

21 German imports from developing countries

German imports from developing countries¹⁾ in billion EUR



¹⁾ Developing countries excl. advanced developing countries. ²⁾ ACP = Africa, the Caribbean and the Pacific Area.
²⁾ Provisional figures.

Millennium Development Goals: Progress chart (2011)



Goals and Targets	Africa		Asia				Oceania	Latin America & Caribbean	Caucasus & Central Asia
	Northern	Sub-Saharan	Eastern	South-Eastern	Southern	Western			

GOAL 1 | Eradicate extreme poverty and hunger

Reduce extreme poverty by half	low poverty	very high poverty	high poverty	high poverty	very high poverty	low poverty	—	moderate poverty	high poverty
Productive and decent employment	very large deficit in decent work	very large deficit in decent work	moderate deficit in decent work	very large deficit in decent work	very large deficit in decent work	very large deficit in decent work	very large deficit in decent work	moderate deficit in decent work	large deficit in decent work
Reduce hunger by half	low hunger	very high hunger	moderate hunger	moderate hunger	high hunger	moderate hunger	—	moderate hunger	moderate hunger

GOAL 2 | Achieve universal primary education

Universal primary schooling	high enrolment	moderate enrolment	high enrolment	high enrolment	high enrolment	moderate enrolment	—	high enrolment	high enrolment
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GOAL 3 | Promote gender equality and empower women

Equal girls' enrolment in primary school	close to parity	close to parity	parity	parity	parity	close to parity	away from parity	parity	parity
Women's share of paid employment	low share	medium share	high share	medium share	low share	low share	medium share	high share	high share
Women's equal representation in national parliaments	low representation	moderate representation	moderate representation	low representation	low representation	very low representation	very low representation	moderate representation	low representation

Millennium Development Goals: Progress chart (2011)

GOAL 4 | Reduce child mortality

Reduce mortality of under-five-year-olds by two thirds	low mortality	high mortality	low mortality	low mortality	moderate mortality	low mortality	moderate mortality	low mortality	low mortality
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GOAL 5 | Improve maternal health

Reduce maternal mortality by three quarters *	low mortality	very high mortality	low mortality	moderate mortality	high mortality	low mortality	high mortality	low mortality	low mortality
Access to reproductive health	moderate access	low access	high access	moderate access	moderate access	moderate access	low access	high access	moderate access

GOAL 6 | Combat HIV/AIDS, malaria and other diseases

Halt and begin to reverse the spread of HIV/AIDS	low incidence	high incidence	low incidence	low incidence	low incidence	low incidence	intermediate incidence	low incidence	low incidence
Halt and reverse spread of tuberculosis	low mortality	high mortality	moderate mortality	high mortality	moderate mortality	low mortality	moderate mortality	low mortality	moderate mortality

Millennium Development Goals: Progress chart (2011)

GOAL 7 | Ensure environmental sustainability

Reverse loss of forests	low forest cover	medium forest cover	medium forest cover	high forest cover	medium forest cover	low forest cover	high forest cover	high forest cover	low forest cover
Halve proportion of population without improved drinking water	high coverage	low coverage	moderate coverage	moderate coverage	moderate coverage	high coverage	low coverage	high coverage	moderate coverage
Halve proportion of population without sanitation	moderate coverage	very low coverage	low coverage	low coverage	very low coverage	moderate coverage	low coverage	moderate coverage	high coverage
Improve the lives of slum-dwellers	moderate proportion of slum-dwellers	very high proportion of slum-dwellers	moderate proportion of slum-dwellers	high proportion of slum-dwellers	high proportion of slum-dwellers	moderate proportion of slum-dwellers	moderate proportion of slum-dwellers	moderate proportion of slum-dwellers	—

GOAL 8 | Develop a global partnership for development

Internet users	high usage	low usage	high usage	moderate usage	low usage	high usage	low usage	high usage	high usage
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The progress chart operates on two levels. The words in each box indicate the present degree of compliance with the target. The colours show progress towards the target according to the legend below:

- Target already met or expected to be met by 2015.
- Progress insufficient to reach the target if prevailing trends persist.
- No progress or deterioration.
- Missing or insufficient data.

* Red colour refers to insufficient progress (i.e. MMR has declined less than 2 per cent annually).

For the regional groupings and country data, see mdgs.un.org. Country experiences in each region may differ significantly from the regional average. Due to new data and revised methodologies, this Progress Chart is not comparable with previous versions.

How to measure and track Sustainability?

NO.	事例		
1	国際競争力ランキング	国際経営開発研究所 (IM D)	世界の60カ国の競争力ランキングを323の基準で毎年報告している。総合ランキングでは、日本は23位(2004年)。
2	NationMaster.com		世界各国の4000を超える統計データが見られる。図で国別比較もできる。
3	Environmental Sustainability Index (ESI)	コロンビア大学、エール大学	5つの構成要素で、21の指標を設定。
4	主要環境指標	経済協力開発機構 (OECD)	気候変動、オゾン層など10の指標
5	環境指標	国連環境計画・アジア太平洋地域事務所 (UNEP/ROAP)	北東アジア、中央アジアなど地域別に環境指標を設定した
6	The Wellbeing of Nation	国際自然連合 (IUCN)	180カ国の持続可能性をランキング
7	人間開発報告書	国連開発計画	人間開発指数(1人当たりのGDP、平均寿命、就学率から算出)を開発の度合いを測定する尺度として設定、毎年報告書を作成
8	持続可能な開発のための指標と情報システム	ドネラH.メドウズ	バロングループへの報告として1998年に作成。持続可能性指標のフレームワークが提案されている。
9	Limits to Growth: The 30-Year Update	ドネラH.メドウズ	1972年に出された「成長の限界」の改訂版。
10	持続可能な開発指標	国連持続可能な開発委員会 (CSD)	経済、環境、社会、制度の4つのフレームで指標を設定

Limits to Growth – The 30-Year Update

Key question:

Are current policies leading to a sustainable future or to collapse? What can be done to create a human economy that provides sufficiently for all?

⇒ Systems Thinking

⇒ Computer Modeling (exponential growth, feedback loops, sources & sinks, overshoot..)

⇒ 10 different scenarios

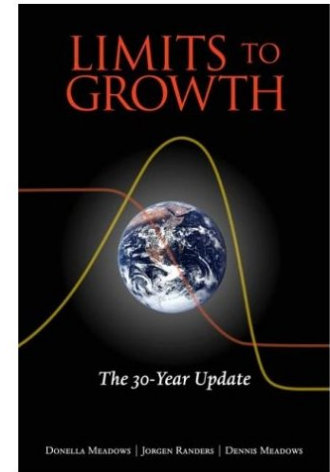
⇒ Asking for Choice

“Limits to Growth – The 30-Year Update”

Some quotations

“We worry that current policies will produce global overshoot and collapse through ineffective efforts to anticipate and cope with ecological limits.”

“Ecological overshoot seems to us to be a much more important concept in the 21st century than free trade. But it is far behind in the fight for public attention and respect. This book is a new attempt to close that gap.”



Key points

1. **10 different pictures** of how the 21st century may evolve
2. Purpose is to **encourage learning, reflection, and personal choice.**
3. Report will be updated in 2012 – there will be abundant data to test the reality
4. “You have to form your own opinion about causes and consequences of growth in the human ecological foot print.”

World 3 Model – looking at dynamic systems

- ✓ Sets of interconnected material and immaterial elements that change overtime
- ✓ Many elements of demography, economy, and the environment as one planetary system
 - Stocks and flows
 - feedback loops
 - sources & sinks
 - thresholds
 - Overshoot

=> See demo simulation soft “Stella”

“Overshoot”

<daily examples>

hangover, driving on icy road, CFCs, stock market...

<Causes>

- Growth, acceleration, rapid change
- Limit, barrier
- Delay or mistake in the perceptions and the responses that strive to keep the systems within its limits

<Results>

- Crash of some kind
- Deliberate turnaround, correction, careful easing down

World 3 Model - Lesson

- When do we start observing the effect of “overshoot”?

⇒ First decade of the 21st century will still be a period of growth.

⇒ It will take another decade before the consequences of overshoot are clearly observable and two decades before the overshoot is generally acknowledged.

Lessons from World3

✓ Change the “structure”

- Change feedback structure/information links in the system
- Change the content and timeliness of the data that actors in the system have to work with
- Change the ideas, goals, incentives, costs, and feedbacks that motivates or constrain behavior
- In time, system with a new information structure is likely to change its social and physical structures.
- It may develop new laws, organizations, technologies, people with new skills, machines and buildings.
- Such a transformation need not be directed centrally; it can be unplanned, natural, evolutionary, exciting, joyful.

The Environmental Sustainability Index (ESI)

- World Economic Forum, The Yale Center for Environmental Law and Policy, and the Columbia University
- a measure of overall progress towards environmental sustainability.
- 5 components
- Permits cross-national comparisons of environmental progress in a systematic and quantitative fashion.
- Published in 2002, updated in 2005.

The ESI in action...

“As a conceptual framework and analytic tool, the Environmental Sustainability Index has now been introduced to the policymaking discourse in the Philippines. As Chair of the Committee on Ecology in the House of Representatives, I have called on the government to be more serious about measuring the efficacy of programs and policies -- and the ESI provides a way to benchmark our performance and identify successful strategies.”

*Neric Acosta
Congressman and Chair of the Committee on Ecology
Manila, The Philippines*

Environmental Sustainability Index – Rankings and Scores

ESI Rank	CountryName	ESI Score	OECD Rank	Non-OECD Rank	ESI Rank	CountryName	ESI Score	OECD Rank	Non-OECD Rank	ESI Rank	CountryName	ESI Score	OECD Rank	Non-OECD Rank
1	Finland	75.1	1		50	Cameroon	52.5		32	99	Azerbaijan	45.4		73
2	Norway	73.4	2		51	Ecuador	52.4		33	100	Kenya	45.3		74
3	Uruguay	71.8		1	52	Laos	52.4		34	101	India	45.2		75
4	Sweden	71.7	3		53	Cuba	52.3		35	102	Poland	45.0	27	
5	Iceland	70.8	4		54	Hungary	52.0	19		103	Niger	45.0		76
6	Canada	64.4	5		55	Tunisia	51.8		36	104	Chad	45.0		77
7	Switzerland	63.7	6		56	Georgia	51.5		37	105	Morocco	44.8		78
8	Guyana	62.9		2	57	Uganda	51.3		38	106	Rwanda	44.8		79
9	Argentina	62.7		3	58	Moldova	51.2		39	107	Mozambique	44.8		80
10	Austria	62.7	7		59	Senegal	51.1		40	108	Ukraine	44.7		81
11	Brazil	62.2		4	60	Zambia	51.1		41	109	Jamaica	44.7		82
12	Gabon	61.7		5	61	Bosnia & Herze	51.0		42	110	United Arab Em.	44.6		83
13	Australia	61.0	8		62	Israel	50.9		43	111	Togo	44.5		84
14	New Zealand	60.9	9		63	Tanzania	50.3		44	112	Belgium	44.4	28	
15	Latvia	60.4		6	64	Madagascar	50.2		45	113	Dem. Rep. Congo	44.1		85
16	Peru	60.4		7	65	United Kingdom	50.2	20		114	Bangladesh	44.1		86
17	Paraguay	59.7		8	66	Nicaragua	50.2		46	115	Egypt	44.0		87
18	Costa Rica	59.6		9	67	Greece	50.1	21		116	Guatemala	44.0		88
19	Croatia	59.5		10	68	Cambodia	50.1		47	117	Syria	43.8		89
20	Bolivia	59.5		11	69	Italy	50.1	22		118	El Salvador	43.8		90
21	Ireland	59.2	10		70	Bulgaria	50.0		48	119	Dominican Rep.	43.7		91
22	Lithuania	58.9		12	71	Mongolia	50.0		49	120	Sierra Leone	43.4		92
23	Colombia	58.9		13	72	Gambia	50.0		50	121	Liberia	43.4		93
24	Albania	58.8		14	73	Thailand	49.7		51	122	South Korea	43.0	29	
25	Central Afr. Rep.	58.7		15	74	Malawi	49.3		52	123	Angola	42.9		94
26	Denmark	58.2	11		75	Indonesia	48.8		53	124	Mauritania	42.6		95
27	Estonia	58.2		16	76	Spain	48.8	23		125	Philippines	42.3		96
28	Panama	57.7		17	77	Guinea-Bissau	48.6		54	126	Libya	42.3		97
29	Slovenia	57.5		18	78	Kazakhstan	48.6		55	127	Viet Nam	42.3		98
30	Japan	57.3	12		79	Sri Lanka	48.5		56	128	Zimbabwe	41.2		99
31	Germany	56.9	13		80	Kyrgyzstan	48.4		57	129	Lebanon	40.5		100
32	Namibia	56.7		19	81	Guinea	48.1		58	130	Burundi	40.0		101
33	Russia	56.1		20	82	Venezuela	48.1		59	131	Pakistan	39.9		102
34	Botswana	55.9		21	83	Oman	47.9		60	132	Iran	39.8		103
35	P. N. Guinea	55.2		22	84	Jordan	47.8		61	133	China	38.6		104
36	France	55.2	14		85	Nepal	47.7		62	134	Tajikistan	38.6		105
37	Portugal	54.2	15		86	Benin	47.5		63	135	Ethiopia	37.9		106
38	Malaysia	54.0		23	87	Honduras	47.4		64	136	Saudi Arabia	37.8		107
39	Congo	53.8		24	88	Côte d'Ivoire	47.3		65	137	Yemen	37.3		108
40	Netherlands	53.7	16		89	Serbia & Mont.	47.3		66	138	Kuwait	36.6		109
41	Mali	53.7		25	90	Macedonia	47.2		67	139	Trinidad & Tob.	36.3		110
42	Chile	53.6		26	91	Turkey	46.6	24		140	Sudan	35.9		111
43	Bhutan	53.5		27	92	Czech Rep.	46.6	25		141	Haiti	34.8		112
44	Armenia	53.2		28	93	South Africa	46.2		68	142	Uzbekistan	34.4		113
45	United States	52.9	17		94	Romania	46.2		69	143	Iraq	33.6		114
46	Myanmar	52.8		29	95	Mexico	46.2	26		144	Turkmenistan	33.1		115
47	Belarus	52.8		30	96	Algeria	46.0		70	145	Taiwan	32.7		116
48	Slovakia	52.8	18		97	Burkina Faso	45.7		71	146	North Korea	29.2		117
49	Ghana	52.8		31	98	Nigeria	45.4		72					

Note: The 2005 ESI scores are not directly comparable to the 2002 ESI scores. See Appendix A for details on methodological changes.

The 2005 Environmental Sustainability Index (ESI) benchmarks the ability of nations to protect the environment over the next several decades. It does so by integrating 76 data sets – tracking natural resource endowments, past and present pollution levels, environmental management efforts, and a society’s capacity to improve its environmental performance – into 21 indicators of environmental sustainability.

These indicators permit comparison across the following five fundamental components of sustainability: Environmental Systems; Environmental Stresses; Human Vulnerability to Environmental Stresses; Societal Capacity to Respond to Environmental Challenges; and Global Stewardship.

The issues reflected in the indicators and the underlying variables were chosen through an extensive review of the environmental literature, assessment of available data, rigorous analysis, and broad-based consultation with policymakers, scientists, and indicator experts.

The ESI provides a powerful environmental decisionmaking tool tracking national environmental performance and facilitating

comparative policy analysis. It enables a more data-driven and empirical approach to policymaking.

While absolute measures of sustainability remain elusive, many aspects of environmental sustainability can be measured on a relative basis with results that provide a context for policy evaluations and judgments. Such comparisons are especially important in the new context of worldwide efforts to advance the environment-related aspects of the Millennium Development Goals.

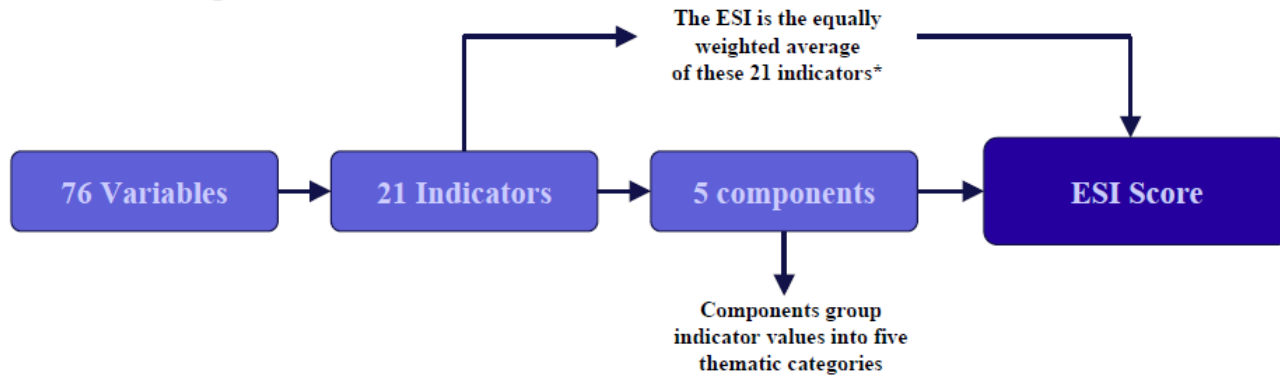
Higher ESI scores suggest better environmental stewardship. The five highest-ranking countries are Finland, Norway, Uruguay, Sweden, and Iceland – all countries that have substantial natural resource endowments, low population density, and have managed the challenges of development with some success.

The lowest ranking countries are North Korea, Iraq, Taiwan, Turkmenistan, and Uzbekistan. These countries face numerous issues, both natural and manmade, and have not managed their policy choices well.

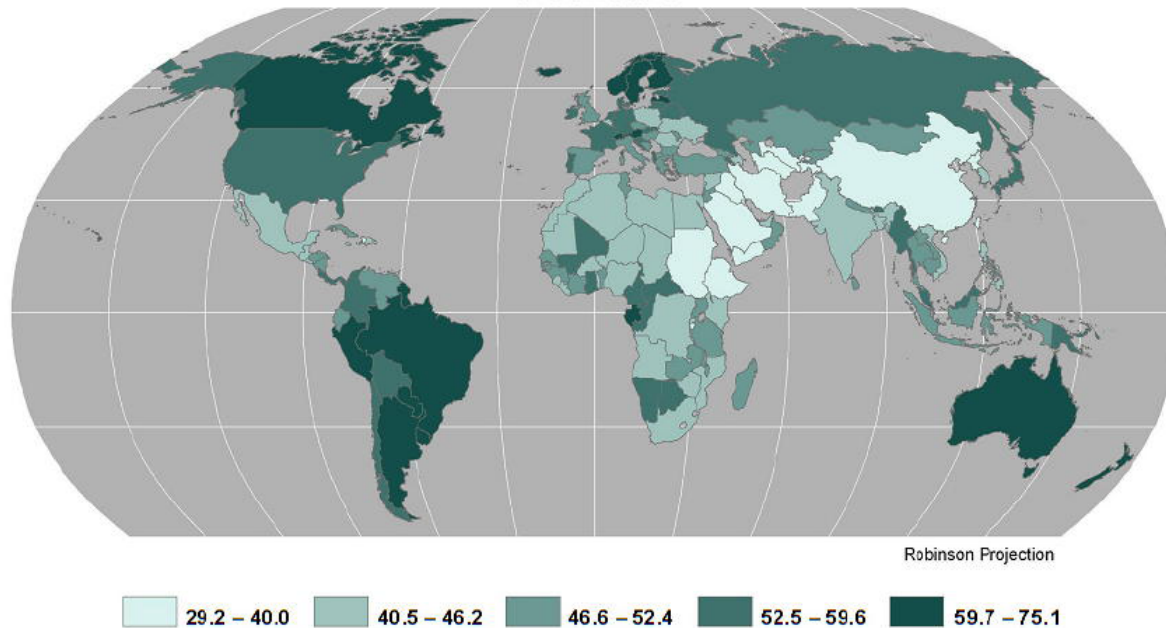
A number of core policy conclusions emerge from the ESI analysis:

- The ESI provides a valuable tool for benchmarking environmental stewardship and permits comparative policy analysis.
- Environmental stewardship demands attention to a wide range of pollution control and natural resource management issues.
- Developing and developed countries face distinct environmental challenges – the pollution pressures of industrialization on one hand and the stresses of poverty and incapacity on the other.
- Economic success contributes to the potential of environmental success but does not guarantee it. Environmental stewardship depends on both policy efforts and a society’s over-arching social, political, and economic systems.
- While it appears that no country is on a fully sustainable trajectory, at every level of development, some countries are managing their environmental challenges better than others.
- Measures of governance, including the rigor of regulation and the degree of cooperation with international policy efforts, correlate highly with overall environmental success. This result suggests that emphasis on good governance may be justified.
- The lack of reliable data to measure performance on a number of issues and across many countries hinders attempts to move toward more data-driven and empirical decisionmaking.

Constructing the ESI



Environmental Sustainability Index Country Scores by Quintile



*Note: While the equal weighting of the indicators has some affect on ESI Scores, sensitivity analysis demonstrates the relative robustness of the ESI structure.

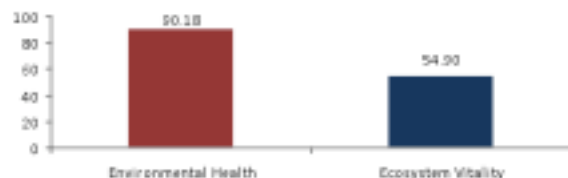
Environmental Performance Index (EPI)

Japan

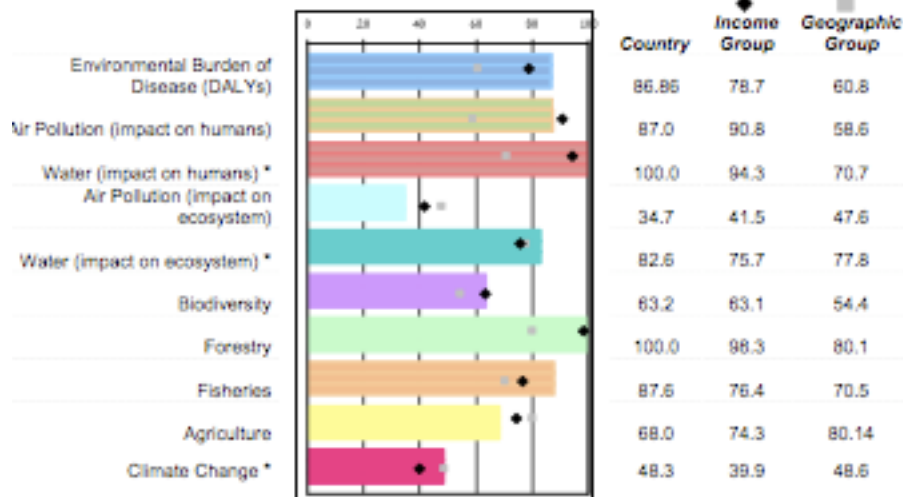
EAST ASIA AND THE PACIFIC

GDP/capita 2007 est. (PPP) \$31,689
Income Decile 2 (1=high, 10=low)

Environmental objectives:



Policy Categories



2010 ENVIRONMENTAL PERFORMANCE INDEX	
Rank:	20
Score:	72.5
Income Group Average:	66.1
Geographic Group Average:	57.1

Indicators

Indicator	Value	Target	Proximity to Target (100=on target)
DALY: Environmental Burden of Disease (DALY)	15.0	0	86.9
INDOOR: Indoor air pollution (%)	5.0	100	94.7
OUTDOOR: Outdoor air pollution ($\mu\text{g}/\text{m}^3$)	29.6	100	79.3
ACSAT: Access to sanitation (%)*	100.0	100	100.0
WATSUP: Access to water (%)	100.0	100	100.0
SO2: Sulfur dioxide emissions (Gg/1000 sq km)	2.1	<= 0.01	44.2
NOX: Nitrogen oxides emissions (Gg/1000 sq km)	5.3	<= 0.01	33.8
NMVC: Non-methane volatile organic compound emissions (Gg/1000 sq km)	4.5	<= 0.01	32.7
OZONE: Ecosystem ozone (ppb)	64317701.1	0	9.3
WQI: Water quality index *	87.8	100	87.8
WSI: Water scarcity index	0.0	0	100.0
WATSTR: Water stress index	5.6	0	54.9
PACOV: Biome protection (%)	10.0	>= 10	100.0
MPAEZ: Marine protection (%)	0.2	>= 10	7.6
AZE: Critical habitat protection (%)	45.0	100	45.0
FORGRO: Growing stock change (ratio)	1.1	>= 1	100.0
FORCOV: Forest cover change (%)	--	>= 0	--
MTI: Marine trophic index (slope)	0.02	>= 0	100.0
EEZTD: Trawling and dredging intensity (%)	24.7	0	75.3
AGWAT: Agricultural water intensity (%)	12.8	<= 10	90.0
AGSUB: Agricultural subsidies (NRA)	0.7	0	0.0
AGPEST: Pesticide regulation	22.0	22	100.0
GHGCAP: Greenhouse gas emissions per capita including land use emissions (Mt CO2 eq) *	10.8	2.5	52.5
GHGIND: Industrial greenhouse gas emissions intensity (CO2 per mill US\$)	65.1	36.3	72.2
CO2KWH: CO2 emissions per electricity generation (CO2 per kWh) *	450.4	0	15.9

1st lecture -- Lessons

1) What is Sustainability?

- Variety of definitions
- Conditions + Values (participation, equity, wellbeing, etc.)

2) How are countries responding?

- Climate change targets
- National strategies and indicators

3) How to measure and track it?

- Models / index