

Sustainability

- Explain it with your own terms

Japan for Sustainability/ Eco Networks
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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
- Eco Networks Co. (Sustainability Consulting Firm)
 - Consulting
 - visions/targets/strategy
 - reporting
 - Communication
 - contents
 - dialogue
 - social networking



Japan for Sustainability - www.japanfs.org

The screenshot shows the homepage of the Japan for Sustainability website. The header features the logo and navigation links. The main content area includes a large red banner with the date '20101018' and a news article titled '[Newslatter] Transforming Agriculture and Economy to Save the Japanese Crested Ibis: Sado Island'. Below this, there are several smaller news items with dates and titles, such as 'New Contents - introducing the State of Renewability in Japan' and 'Less articles via JFS on Fergana'.

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+
- Supported by Online volunteers
- More than 700 volunteers around the world
- Diversity : vocation, age, gender, region/country
- Membership: 70 corporates, 200 individuals

The screenshot shows a section of the website with a list of recent articles. The first article is titled 'Environmental "Green Planet" Island City to Float in Equatorial Pacific Ocean' and is dated 2010.09.18. Other articles include 'ID-YOKOJO in Fergana Closed-Loop Agriculture by Seven Farm' and 'Four More Global Companies Join Smart City Project'. The sidebar on the right contains 'POPULAR ARTICLES' and 'KEYWORDS'.

Activities

1. Provides a variety of information on the environment and sustainability, from Japan to the world, via our web site and e-mail magazines.
2. Covers not only current developments but also traditional wisdom, craftsmanship and practices of day-to-day life, as well as local activities.
3. Works to develop special partnerships with people in Asia, in order to cooperate to find paths toward sustainability in this region.
4. Welcomes feedback and comments from overseas and shares them in Japan and with partners in Asia, so that we can improve efforts and activities in this region by learning from each other.
5. **Creates a vision for a sustainable Japan through discussion among various stakeholders.**

Goal

Imagine that we are holding “World Summit on Sustainable Development” in this room.

You should be able to present the followings;

- what is sustainability (with your own terms)
- what is your vision/indicators/policies for sustainability (with your own logic)

Plan

10/18

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

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

10/25

- 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

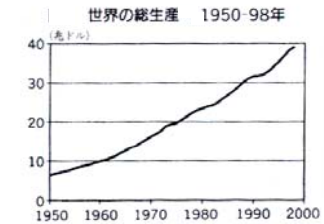
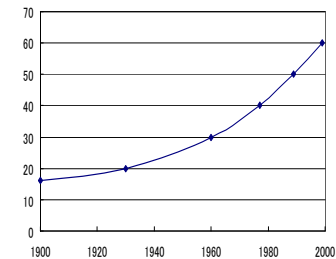
1) What is sustainability? (Background and definitions)

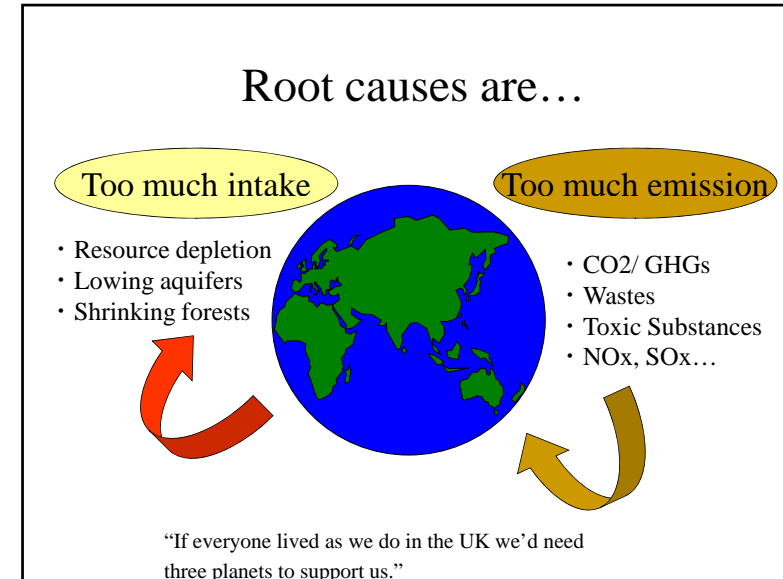
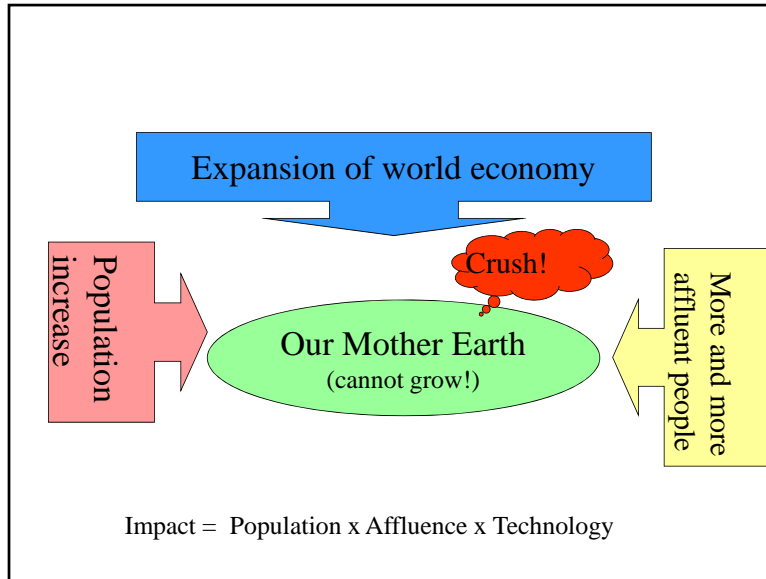
Background: Root causes of global environmental crisis

Population

×

World Economy





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

フォアキャストイング手法

バックキャストイング手法

©Takashi Yoshida

Positive signs on climate change

(As of 2009/10, before Copenhagen)

“Across the world, commitments are forthcoming”

The new US administration is supporting strong American action.

China is setting ambitious targets for reducing energy intensity and making massive investments in renewable energy.

India has put forward its own action plan.

Europe has set a goal of cutting emissions by 30% below 1990 levels by 2020 if there is an ambitious global agreement.

Japan has published its proposals for major carbon reductions.

Copenhagen Accord (2009/12)

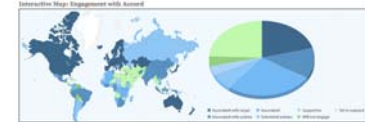
- not legally binding
- agrees cooperation in peaking (stopping from rising) global and national greenhouse gas emissions "as soon as possible" and that "a low-emission development strategy is indispensable to sustainable development"



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



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 (4/)	Share of World's Total GHGs	CO ₂ Emissions per capita (tCO ₂ e)	Source
China	1/29 2010	Nationally appropriate mitigation actions and a letter indicating association. Also provided additional information saying "China highly commends and supports the Copenhagen Accord". Read more	Associated with actions	40 to 45%	N/A	↓	See Note ⁶	15.64%	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 (EU27)	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% ³	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 Note ¹⁰	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

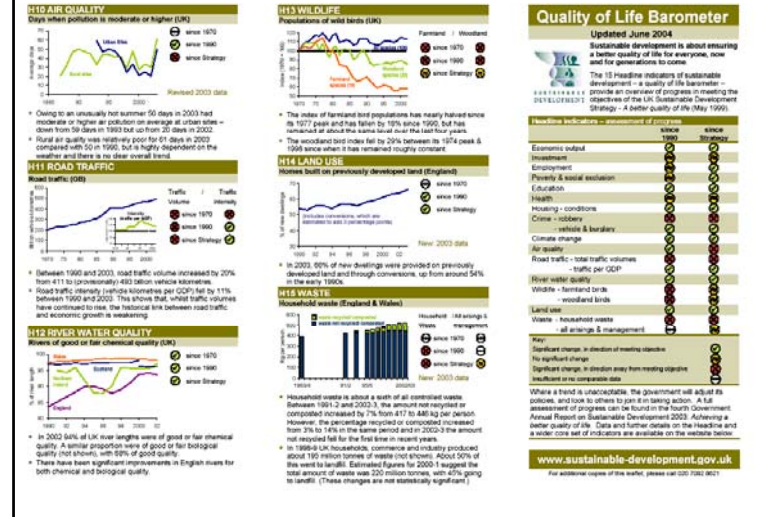
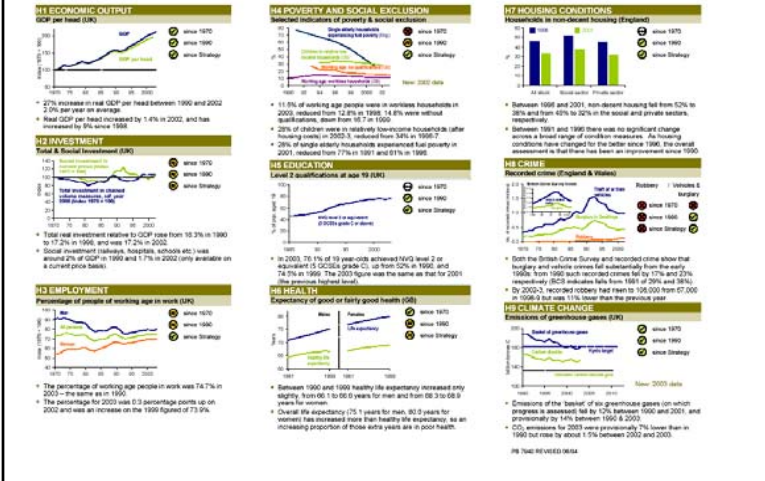
<http://www.usclimatenetwork.org/policy/copenhagen-accord-commitments>

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」「社会的まとも」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

詳細: 国等が作成する持続可能性指標 <http://www.nies.go.jp/sdi-db/reference.php>

UK headline indicators



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	Change since 2003	Direction in latest year*
1. Greenhouse gas emissions	✓	✓	✓
13. Resource use	✓	✓	✓
14. Waste arising	✓	✓	✓
20. Bird populations	Farmland Woodland Seabird	✓ ✓ ✓	✓ ✓ ✓
27. Fish stocks sustainability	✓	✓	✓
28. Ecological impacts of air pollution	Acidity Nitrogen Chlorine	✓ ✓ ✓	✓ ✓ ✓
30. River quality	✓	✓	✓
32. Economic output	✓	✓	✓
37. Active community participation	✓	✓	✓
38. Crime	✓	✓	✓
40. Employment	✓	✓	✓
41. Workless households	Before housing cost After	✓ ✓	✓ ✓
43. Childhood poverty	Before housing cost After	✓ ✓	✓ ✓
45. Pensioner poverty	Before housing cost After	✓ ✓	✓ ✓

Indicator number and title	Change since 1990	Change since 2003	Direction in latest year*
47. Educational attainment	✓	✓	✓
49. Health inequality	Infant mortality SPD Life expectancy CRP	✓ ✓ ✓ ✓	✓ ✓ ✓ X
56. Mobility	Walking / cycling Public transport use	✓ ✓	✓ ✓
59. Social justice	✓	✓	✓
60. Environmental equality	✓	✓	✓
60. Wellbeing	✓	✓	✓

* Years shown if not 1990 † 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 Using resources economically and efficiently	Energy productivity	Doubling between 1990 and 2020	☀️
1b		Raw material productivity	Doubling between 1994 and 2020	☁️
2	Climate protection Reducing greenhouse gases	Greenhouse gas emissions	Reduction of 21% compared to 1990 until 2008/2012	☀️
3a	Renewable energies Strengthening a sustainable energy supply	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 Sustainable land use	Increase in land use for housing and transport	Reduction in daily increase to 30 hectares by 2020	☁️
5	Species diversity Conserving species - protecting biodiversity	Species diversity and landscape quality	Increase to the index value 100 by 2015	☀️
6	National debt Consolidating the budget - creating intergenerational equity	National deficit	Structurally balanced public spending; Federal budget without net borrowing from 2011 at latest	☀️

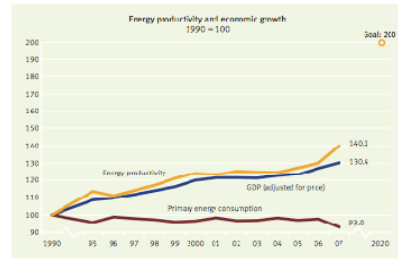
☀️ The target value of the indicator has been achieved or the remaining 'distance' would be covered by the target year (deviation less than 5%).
 ☁️ The indicator is developing in the right direction, but if the annual trend continues unaltered there will still be a gap of between 5 and 20% which will 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.

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 www.sustainable-development.gov.uk

I. Intergeneration equity

Resource Protection

Using resources economically and efficiently



Source: Federal Statistical Office, Working Group on Energy Balances AGE/B

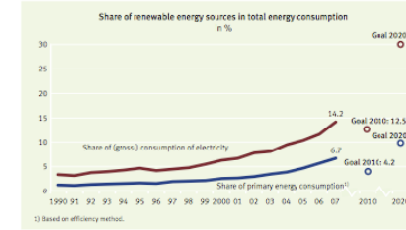
1a Energy productivity

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 cooling 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 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

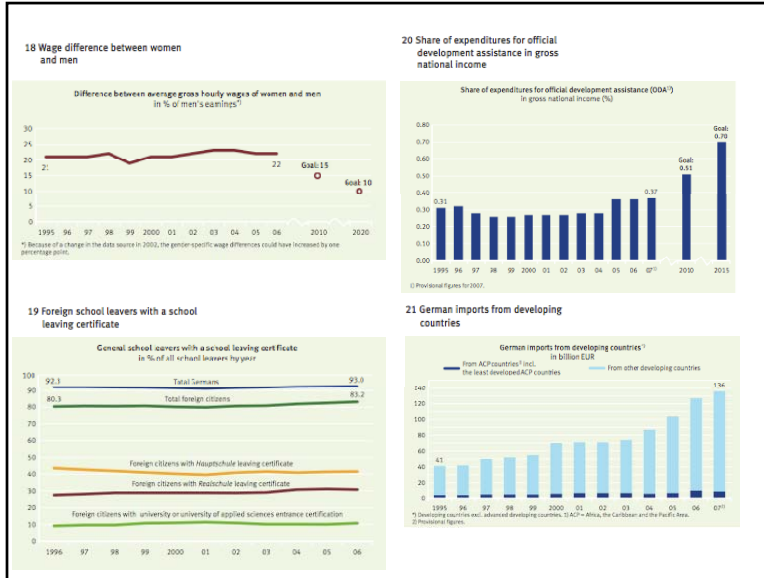
3a,b Share of renewable energy sources in total energy consumption

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 Creating favourable investment conditions – securing long-term prosperity	Gross fixed capital formation in relation to gross domestic product (GDP)	Increase in the share	
8	Innovation Shaping the future with new solutions	Private and public spending on research and development	Increase to 3 % of GDP by 2010	
9a	Education and training Continuously improving education and vocational training	18- to 24-year-olds without a school-leaving certificate	Reduction in proportion to 3% 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 Raising economic output by environmentally and socially compatible means	Gross domestic product per capita	Economic growth	
III. Sustainability				
no.	Indicator areas Sustainability axiom	Indicators	Goals	Status
11a	Mobility Guaranteeing mobility – protecting the environment	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 83 % 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 Environmentally sound production in our cultivated landscape	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 Keeping the environment healthy	Air pollution	Reduce to 30 % compared to 1990 by 2010	

No.	Indicator areas Sustainability axiom	Indicators	Goals	Status
14a	Health and nutrition Living more healthily for longer	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 Further increasing personal security	Burglaries in homes	Reduction in cases to under 100,000/year by 2015	
III. Social cohesion				
16a	Employment Boosting employment/leaves	Employment rate (total) (15- to 64-year-olds)	Increase to 73 % by 2010 and 75 % by 2020	
16b		Employment rate (fuller people) (15- to 64-year-olds)	Increase to 55 % by 2010 and 57 % by 2020	
IV. Social cohesion				
No.	Indicator areas Sustainability axiom	Indicators	Goals	Status
17a	Perspectives for families Improving the compatibility of work and family life	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 (2- to 3-year-olds)	Increase to 30 % by 2010 and 60 % by 2020	
18	Equal opportunities Promoting equal opportunities in society	Wage difference between women and men	Reduce the difference to 15 % by 2010 and to 10 % by 2020	
19	Integration Integration instead of exclusion	Foreign school leavers with a school leaving certificate	Increase in the proportion of foreign school leavers with at least Hauptschule certificate and agreement with quota for German school leavers by 2020	
IV. International responsibility				
20	Development cooperation Supporting sustainable development	Share of expenditures for official development assistance in gross national income	Increase to 0.5 % by 2010 and 0,7 % by 2015	
21	Opening markets Improving trade opportunities for developing countries	Customs imports from developing countries	Further increase	



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 (IMD)	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。国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	パラ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

How Sustainable is Japan?

5 components

- Environmental Systems 32/100 **NEGATIVE**
 - Air Quality/water/biodiversity/land
- Reducing Environmental Stresses 37/100 **Mixed**
 - Reducing air pollution/water stress/ecosystem stress...
- Reducing Human Vulnerability 64/100 **Mixed**
 - Basic human sustenance/environmental health
- Social and Institutional Capacity 89/100 **POSITIVE**
 - Env. Governance/Eco Efficiency/ Private Sec. Responsiveness/Science&Tech
- Global Stewardship 78/100 **POSITIVE**
 - Participation in int'l cooperative efforts/reducing greenhouse gas emissions/transboundary environmental pressures

Environmental Sustainability Index – Rankings and Scores

ESI Country/Year	ESI Score	ESI Rank	ESI Country/Year	ESI Score	ESI Rank	ESI Country/Year	ESI Score	ESI Rank
1 Finland	91.1	1	95 Cameroon	12.1	207	91 Cambodia	41.6	174
2 Norway	79.4	2	96 Ecuador	12.4	208	92 Korea	41.3	174
3 Uruguay	78.8	3	97 Laos	12.4	208	93 Chile	41.3	174
4 Iceland	72.7	4	98 Cuba	12.1	207	94 Poland	41.0	177
5 Ireland	70.8	5	99 Bulgaria	12.0	209	95 Niger	40.0	180
6 Canada	69.4	6	100 Senegal	11.8	210	96 Czech	40.0	177
7 Luxembourg	67.7	7	101 Georgia	12.1	207	97 Morocco	40.0	180
8 Singapore	65.9	8	102 Uganda	12.1	207	98 Rwanda	40.0	180
9 Australia	65.1	9	103 Slovakia	12.1	207	99 Madagascar	40.0	180
10 Austria	63.7	10	104 Portugal	12.1	207	100 Ukraine	40.0	180
11 Hong Kong	62.1	11	105 Serbia	12.1	207	101 Tanzania	40.0	180
12 Sweden	61.7	12	106 Belize & Dem	12.1	207	102 United Arab Em	40.0	180
13 Australia	60.0	13	107 Israel	12.0	209	103 Togo	40.0	180
14 New Zealand	59.0	14	108 Vietnam	12.1	207	104 Botswana	40.0	180
15 Latvia	58.4	15	109 Madagascar	12.0	209	105 Dem. Rep Congo	40.0	180
16 Peru	58.4	15	110 United Kingdom	12.0	209	106 Bangladesh	40.0	180
17 Portugal	58.1	16	111 Hungary	12.0	209	107 Egypt	40.0	180
18 Czech Rep	58.0	16	112 Greece	12.1	207	108 Denmark	40.0	180
19 Canada	58.0	16	113 Finland	12.1	207	109 Timor	40.0	180
20 Serbia	58.0	16	114 Jpn	12.1	207	110 El Salvador	40.0	180
21 Iceland	58.0	16	115 Belgium	12.0	209	111 Slovenia Rep	40.0	180
22 Lithuania	58.0	16	116 Slovakia	12.0	209	112 Turkmenistan	40.0	180
23 Colombia	58.0	16	117 Ghana	12.0	209	113 Oman	40.0	180
24 Albania	58.0	16	118 Thailand	12.0	209	114 South Korea	40.0	180
25 Cambodia Rep	58.0	16	119 Ukraine	12.0	209	115 Azerb	40.0	180
26 Denmark	58.0	16	120 Indonesia	12.0	209	116 Mauritius	40.0	180
27 Slovenia	58.0	16	121 Iraq	12.0	209	117 Palau	40.0	180
28 Panama	57.5	17	122 Oman	12.0	209	118 Oman	40.0	180
29 Taiwan	57.5	17	123 Kazakhstan	12.0	209	119 Viet Nam	40.0	180
30 Japan	57.5	17	124 Trinidad	12.0	209	120 Cambodia	40.0	180
31 Lithuania	57.5	17	125 Singapore	12.0	209	121 Liberia	40.0	180
32 Sweden	57.5	17	126 Oman	12.0	209	122 Rwanda	40.0	180
33 Norway	57.5	17	127 Myanmar	12.0	209	123 Paraguay	40.0	180
34 Botswana	57.5	17	128 Oman	12.0	209	124 Ben	40.0	180
35 P.R. Spain	57.5	17	129 India	12.0	209	125 China	40.0	180
36 France	57.5	17	130 Oman	12.0	209	126 Pakistan	40.0	180
37 Portugal	57.5	17	131 Oman	12.0	209	127 Oman	40.0	180
38 Indonesia	57.5	17	132 Oman	12.0	209	128 Turkmenistan	40.0	180
39 Congo	57.5	17	133 Oman	12.0	209	129 Oman	40.0	180
40 Netherlands	57.5	17	134 Oman	12.0	209	130 Oman	40.0	180
41 Oman	57.5	17	135 Oman	12.0	209	131 Oman	40.0	180
42 Oman	57.5	17	136 Oman	12.0	209	132 Oman	40.0	180
43 Oman	57.5	17	137 Oman	12.0	209	133 Oman	40.0	180
44 Oman	57.5	17	138 Oman	12.0	209	134 Oman	40.0	180
45 Oman	57.5	17	139 Oman	12.0	209	135 Oman	40.0	180
46 Oman	57.5	17	140 Oman	12.0	209	136 Oman	40.0	180
47 Oman	57.5	17	141 Oman	12.0	209	137 Oman	40.0	180
48 Oman	57.5	17	142 Oman	12.0	209	138 Oman	40.0	180
49 Oman	57.5	17	143 Oman	12.0	209	139 Oman	40.0	180
50 Oman	57.5	17	144 Oman	12.0	209	140 Oman	40.0	180

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

Executive Summary

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 comparisons across the following five fundamental components of sustainable development: Environmental Quality; Environmental Services; Human Vulnerability to Environmental Forces; Society's 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 head-to-head consultation with policymakers, scientists, and academic 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 same 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 challenge of development with some success.

The lowest ranking countries are South 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 case 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 patterns of industrialization on one hand and the stresses of poverty and inequality 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 overarching 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 type 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

The ESI is the equally weighted average of these 21 indicators*

```

    graph LR
      A[76 Variables] --> B[21 Indicators]
      B --> C[5 components]
      C --> D[ESI Score]
      C --> E[Component group indicator values into five thematic categories]
  
```

Environmental Sustainability Index Country Scores by Quintile

Robinson Projection

*Note: While the equal weighting of the indicators has some effect 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:

Indicator	Value	Target	Priority to Target (percentage)
ENV1: Environmental Burden of Disease (DALYs)	193	0	88.8
ENV2: Air quality (PM2.5)	39.9	100	14.7
ENV3: Outdoor Air Quality (PM10)	100.3	100	100.0
ENV4: Acid rain (acid eq.)	105.1	100	100.0
ENV5: Soil fertility (organic carbon)	31	<100.0	44.2
ENV6: Nitrogen loading (nitrate)	53	<100.0	33.8
ENV7: Marine water quality (biodiversity)	43	<100.0	22.3
ENV8: Ecosystems (green space)	84.0	0	91.2
ENV9: Water quality (index)	57.0	100	17.6
ENV10: Atmospheric haze	0.0	0	100.0
ENV11: River water quality	43.1	0	84.8
ENV12: Ocean health (index)	10.3	<100	100.0
ENV13: Marine biodiversity (index)	10.2	<100	7.8
ENV14: Ozone layer depletion (index)	49.0	100	49.0
ENV15: Ozone depletion change (index)	1.1	<100	100.0
ENV16: Forest cover change (index)	37.0	>100	37.0
ENV17: Marine biogenic index (index)	0.02	>100	100.0
ENV18: Fishing and changing intensity (index)	24.7	0	79.3
ENV19: Agricultural water quality (index)	12.6	<100	80.0
ENV20: Agricultural subsidies (index)	0.7	0	0.0
ENV21: Pesticide regulation (index)	22.0	22	100.0
ENV22: Greenhouse gas emissions per capita (index)	10.8	2.0	30.6
ENV23: Fossil fuel emissions per capita (index)	65.1	36.9	72.2
ENV24: CO2 emissions per electricity generation (index)	409.4	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