Sustainability
- Explain it with your own terms

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Presentation

<Mission>

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)

<Process>

- Area: Energy & climate change + economy + food, waste, bio-diversity, resource-productivity, equity, satisfaction…
- Individual work
- Presentation & Discussion

Standards for assessment of progress for sustainable development

http://www.iisd.org/pdf/bellagio.pdf

The “Bellagio Principles”

1. Guiding Vision and Goals
(clarity about sustainability)

2. Holistic Perspective
(systems and subsystems)

3. Essential Elements
(ecology, economics, social equity)

4. Adequate Scope
(temporal and spatial)

5. Practical Focus
(clear standards, manageable tools)

6. Openness
(transparent methods and sources)

7. Effective Communication
(simple, and audience focused)

8. Broad Participation
(diversity, completeness, link to policy)

9. Ongoing Assessment
(iterative, adaptive, learning-focused)

10. Institutional Capacity
(support, maintenance, development)

Good Sustainability Policy?
- 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

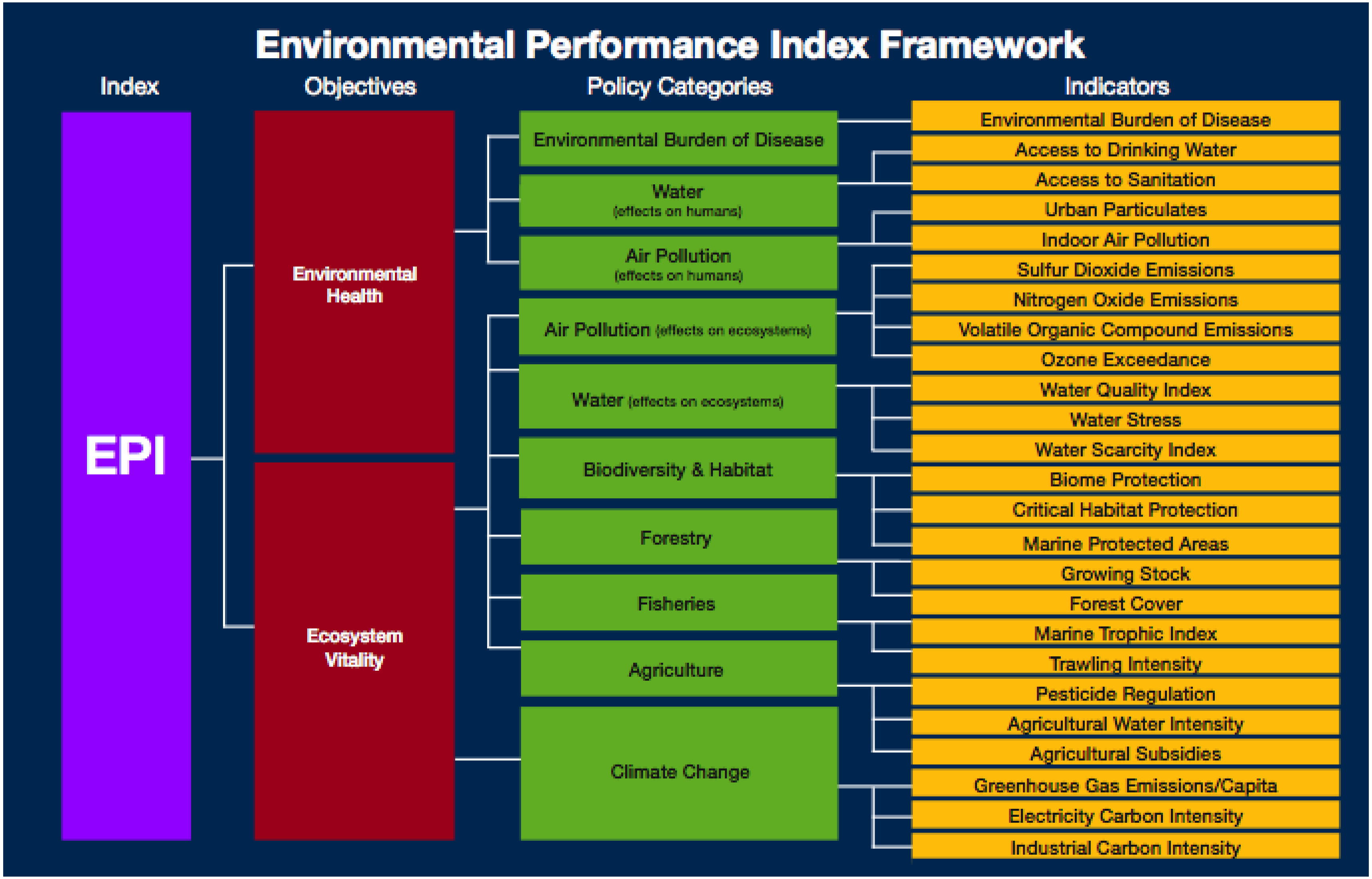
- Change the ideas, goals, incentives, costs, and feedbacks that motivates or constrain behavior

- 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.

EPI 2010



Environmental Performance Index Framework

Index | Objectives | Policy Categories | Indicators

- **EPI**
  - **Environmental Health**
    - Environmental Burden of Disease
      - Environmental Burden of Disease
    - Water (effects on humans)
      - Access to Drinking Water
      - Access to Sanitation
    - Air Pollution (effects on humans)
      - Urban Particulates
      - Indoor Air Pollution
  - **Ecosystem Vitality**
    - Air Pollution (effects on ecosystems)
      - Sulfur Dioxide Emissions
      - Nitrogen Oxide Emissions
      - Volatile Organic Compound Emissions
      - Ozone Exceedance
    - Water (effects on ecosystems)
      - Water Quality Index
      - Water Stress
      - Water Scarcity Index
    - Biodiversity & Habitat
      - Biome Protection
      - Critical Habitat Protection
      - Marine Protected Areas
    - Forestry
      - Growing Stock
      - Forest Cover
    - Fisheries
      - Marine Trophic Index
      - Trawling Intensity
    - Agriculture
      - Pesticide Regulation
      - Agricultural Water Intensity
      - Agricultural Subsidies
    - Climate Change
      - Greenhouse Gas Emissions/Capita
      - Electricity Carbon Intensity
      - Industrial Carbon Intensity

http://epi.yale.edu/file_columns/0000/0007/epi-2010-policy-makers-summary.pdf

Geographic Regional Peer Groups by Rank, Country, and EPI Score

	Sub-Saharan Africa	
1	Mauritius	80.6
2	Djibouti	60.5
3	Namibia	59.3
4	Sao Tome & Principe	57.3
5	Gabon	56.4
6	Eritrea	54.6
7	Swaziland	54.4
8	Côte d'Ivoire	54.3
9	Congo	54.0
10	Dem. Rep. Congo	51.6
11	Malawi	51.4
12	Kenya	51.4
13	Ghana	51.3
14	Mozambique	51.2
15	South Africa	50.8
16	Gambia	50.3
17	Uganda	49.8
18	Madagascar	49.2
19	Tanzania	47.9
20	Zimbabwe	47.8
21	Burkina Faso	47.3
22	Zambia	47.0
23	Guinea-Bissau	44.7
24	Cameroon	44.6
25	Rwanda	44.6
26	Guinea	44.4
27	Burundi	43.9
28	Ehtiopia	43.1
29	Senegal	42.3
30	Equatorial Guinea	41.9
31	Botswana	41.3
32	Chad	40.8
33	Nigeria	40.2
34	Benin	39.6
35	Mali	39.4
36	Niger	37.6
37	Togo	36.4
38	Angola	36.3
39	Mauritania	33.7
40	Central African Rep.	33.3
41	Sierra Leone	32.1

	Mid East & N. Africa	
1	Algeria	67.4
2	Morocco	65.6
3	Syria	64.6
4	Israel	62.4
5	Egypt	62.0
6	Tunisia	60.6
7	Armenia	60.4
8	Turkey	60.4
9	Iran	60.0
10	Lebanon	57.9
11	Jordan	56.1
12	Saudi Arabia	55.3
13	Kuwait	51.1
14	Libya	50.1
15	Qatar	48.9
16	Yemen	48.3
17	Sudan	47.1
18	Oman	45.9
19	Bahrain	42.0
20	Iraq	41.0
21	United Arab Emirates	40.7

	Eastern Europe & Central Asia	
1	Albania	71.4
2	Serbia & Montenegro	69.4
3	Croatia	68.7
4	Belarus	65.4
5	Georgia	63.6
6	Russia	61.2
7	Macedonia	60.6
8	Kyrgyzstan	59.7
9	Azerbaijan	59.1
10	Moldova	58.8
11	Ukraine	58.2
12	Kazakhstan	57.3
13	Bosnia & Herzegovina	55.9
14	Tajikistan	51.3
15	Uzbekistan	42.3
16	Turkmenistan	38.4

	Americas	
1	Costa Rica	86.4
2	Cuba	78.1
3	Colombia	76.8
4	Chile	73.3
5	Panama	71.4
6	Belize	69.9
7	Antigua & Barbuda	69.8
8	Ecuador	69.3
9	Peru	69.3
10	El Salvador	69.1
11	Dominican Republic	68.4
12	Suriname	68.2
13	Mexico	67.3
14	Canada	66.4
15	Paraguay	63.5
16	United States	63.5
17	Brazil	63.4
18	Venezuela	62.9
19	Argentina	61.0
20	Guyana	59.2
21	Uruguay	59.1
22	Jamaica	58.0
23	Nicaragua	57.1
24	Trinidad & Tobago	54.2
25	Guatemala	54.0
26	Honduras	49.9
27	Bolivia	44.3
28	Haiti	39.5

	Europe	
1	Iceland	93.5
2	Switzerland	89.1
3	Sweden	86.0
4	Norway	81.1
5	France	78.2
6	Austria	78.1
7	Malta	76.3
8	Finland	74.7
9	Slovakia	74.5
10	United Kingdom	74.2
11	Germany	73.2
12	Italy	73.1
13	Portugal	73.0
14	Latvia	72.5
15	Czech Republic	71.6
16	Spain	70.6
17	Denmark	69.2
18	Hungary	69.1
19	Lithuania	68.3
20	Luxembourg	67.8
21	Ireland	67.1
22	Romania	67.0
23	Netherlands	66.4
24	Slovenia	65.0
25	Estonia	63.8
26	Poland	63.1
27	Bulgaria	62.5
28	Greece	60.9
29	Belgium	58.1
30	Cyprus	56.3

	Asia and Pacific	
1	New Zealand	73.4
2	Japan	72.5
3	Singapore	69.6
4	Nepal	68.2
5	Bhutan	68.0
6	Maldives	65.9
7	Fiji	65.9
8	Philippines	65.7
9	Australia	65.7
10	Malaysia	65.0
11	Sri Lanka	63.7
12	Thailand	62.2
13	Brunei Darussalam	60.8
14	Laos	59.6
15	Vietnam	59.0
16	South Korea	57.0
17	Myanmar	51.3
18	Solomon Islands	51.1
19	China	49.0
20	India	48.3
21	Pakistan	48.0
22	Indonesia	44.6
23	Papua New Guinea	44.3
24	Bangladesh	44.0
25	Mongolia	42.8
26	North Korea	41.8
27	Cambodia	41.7

Policy Conclusions

Several policy conclusions emerge from the 2010 Environmental Performance Index and analysis of the underlying indicators:

- Environmental decisionmaking can be made more fact-based and empirical. A data-driven approach to policymaking promises to make decisionmaking more analytically rigorous and yield systematically better results.

- While the 2010 EPI demonstrates the potential for better metrics and more refined policy analysis, it also highlights the fact that significant data gaps and methodological limitations hamper movement in this direction.

- Policymakers should move to establish better data collection, methodologically consistent reporting, mechanisms for verification, and a commitment to environmental data transparency.

- Wealth correlates highly with EPI scores. In particular, wealth has a strong association with environmental health results. But at every level of development, some countries fail to keep up with their income-group peers while others achieve outstanding results. Statistical analysis suggests that in many cases good governance contributes to better environmental outcomes.

- Environmental challenges come in several forms, varying with wealth and development. Some issues arise from the resource and pollution impacts of industrialization – including greenhouse gas emissions and rising levels of waste – and largely affect developed countries. Other challenges, such as access to safe drinking water and basic sanitation, derive from poverty and under-investment in basic environmental amenities – and primarily affect developing nations. Limited endowments in water and forest resources constrain choices but need not necessarily impair performance.

- Policymakers need to set clear policy targets and shift toward more analytically rigorous environmental protection efforts at the global, regional, national, state/provincial, local, and corporate scales.

- The EPI uses the best available global datasets on environmental performance. However, the overall data quality and availability is alarmingly poor. The lack of time-series data for most countries and the absence of broadly-collected and methodologically-consistent indicators for basic concerns, such as water quality, still hamper efforts to shift environmental policy onto more empirical grounds.

The 2010 EPI represents a "work in progress." It aims not only to inform but also to stimulate debate on defining the appropriate metrics and methodologies for evaluating environmental performance. Feedback, comments, suggestions, and criticisms are all welcome at our website, http://epi.yale.edu.

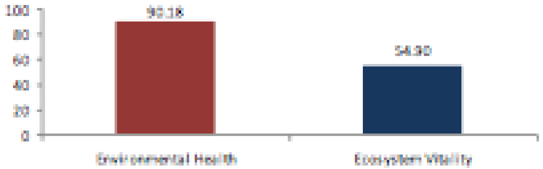
Japan

EAST ASIA AND THE PACIFIC

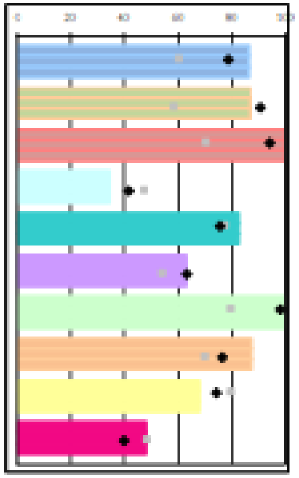
GDP/capita 2007 est. (PPP) $31,689
Income Decile 2 (1=high, 10=low)

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

Environmental objectives:

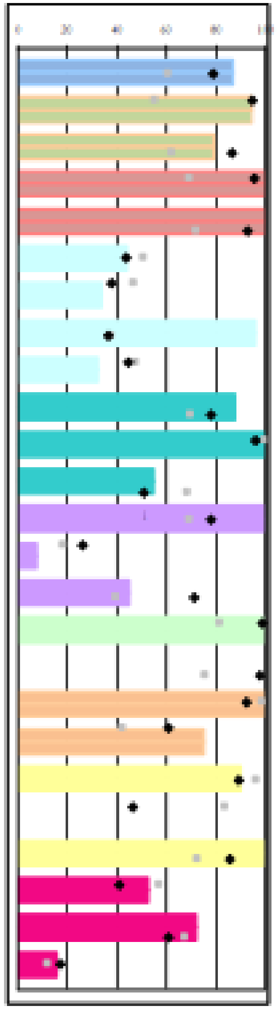


Policy Categories



	Country	◆ Income Group	■ Geographic Group
Environmental Burden of Disease (DALYs)	86.86	78.7	60.8
Air Pollution (impact on humans)	87.0	90.8	58.6
Water (impact on humans) *	100.0	94.3	70.7
Air Pollution (impact on ecosystem)	34.7	41.5	47.6
Water (impact on ecosystem) *	82.6	75.7	77.8
Biodiversity	63.2	63.1	54.4
Forestry	100.0	98.3	80.1
Fisheries	87.6	76.4	70.5
Agriculture	68.0	74.3	80.14
Climate Change *	48.3	39.9	48.6

Indicators



	Value	Target	Proximity to Target (100=target met)
DALY: Environmental Burden of Disease (DALY)	15.0	0	86.9
INDOOR: Indoor air pollution (%)	5.0	0	94.7
OUTDOOR: Outdoor air pollution (μg/m^3)	29.6	20	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
NMVOC: 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
WATSTR: Water stress index	5.6	0	54.9
WSI: Water scarcity index	0.0	0	100.0
PACOV: Biome protection (%)	10.0	>= 10	100.0
MPAEEZ: Marine protection (%)	0.2	>= 10	7.8
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(t CO2 per mil US$)	68.1	36.3	72.2
CO2KWH: CO2 emissions per electricity generation (CO2 per kWh) *	450.4	0	15.9

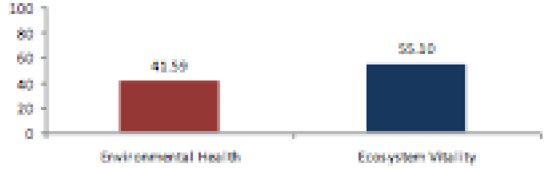
India

2010 ENVIRONMENTAL PERFORMANCE INDEX	
Rank:	**123**
Score:	**48.3**
Income Group Average:	56.2
Geographic Group Average:	58.0

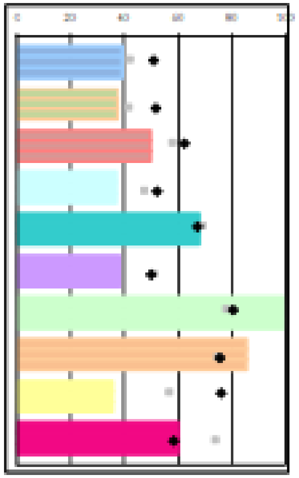
SOUTH ASIA

GDP/capita 2007 est. (PPP) $2,600
Income Decile 7 (1=high, 10=low)

Environmental objectives:

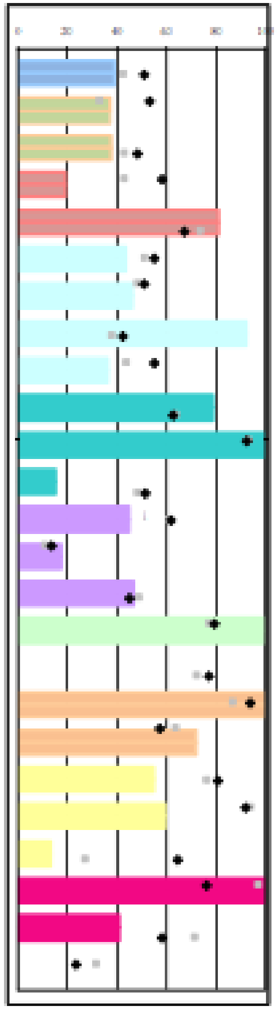


Policy Categories



	Country	◆ *Income Group*	▨ *Geographic Group*
Environmental Burden of Disease (DALYs)	39.35	51.0	42.6
Air Pollution (impact on humans)	37.6	51.6	41.9
Water (impact on humans) *	50.1	62.4	58.6
Air Pollution (impact on ecosystem)	37.1	52.1	47.6
Water (impact on ecosystem) *	68.3	67.3	69.4
Biodiversity	38.6	49.9	51.4
Forestry	100.0	80.6	78.5
Fisheries	86.0	75.5	75.3
Agriculture	35.7	76.0	57.22
Climate Change *	60.2	58.4	74.5

Indicators



	Value	Target	*Proximity to Target (100=target met)*
DALY: Environmental Burden of Disease (DALY)	66.0	0	39.4
INDOOR: Indoor air pollution (%)	59.7	0	37.2
OUTDOOR: Outdoor air pollution (μg/m³)	64.9	20	37.9
ACSAT: Access to sanitation (%)*	28.0	100	19.19
WATSUP: Access to water (%)	89.0	100	81.0
SO2: Sulfur dioxide emissions (Gg/1000 sq km)	2.3	<= 0.01	43.8
NOX: Nitrogen oxides emissions (Gg/1000 sq km)	1.6	<= 0.01	46.4
NMVOC: Non-methane volatile organic compound emissions (Gg/1000 sq km)	3.1	<= 0.01	36.7
OZONE: Ecosystem ozone (ppb)	73890698.2	0	8.8
WQI: Water quality index *	78.9	100	78.9
WATSTR: Water stress index	33.5	0	15.5
WSI: Water scarcity index	0.0	0	100.0
PACOV: Biome protection (%)	4.5	>= 10	45.2
MPAEEZ: Marine protection (%)	0.5	>= 10	17.5
AZE: Critical habitat protection (%)	46.7	100	46.7
FORGRO: Growing stock change (ratio)	1.0	>= 1	100.0
FORCOV: Forest cover change (%)	..	>=0	..
MTI: Marine trophic index (slope)	0.0	>=0	100.0
EEZTD: Trawling and dredging intensity (%)	28.1	0	71.9
AGWAT: Agricultural water intensity (%)	29.7	<=10	55.1
AGSUB: Agricultural subsidies (NRA)	0.1	0	59.5
AGPEST: Pesticide regulation	3.0	22	13.6
GHGCAP: Greenhouse gas emissions per capita including land use emissions (Mt CO2 eq) *	1.7	2.5	100.0
GHGIND: Industrial greenhouse gas emissions intensity(1 CO2 per mil US$)	124.9	36.3	41.0
CO2KWH: CO2 emissions per electricity generation (CO2 per kWh) *	927.5	0	0.0

China

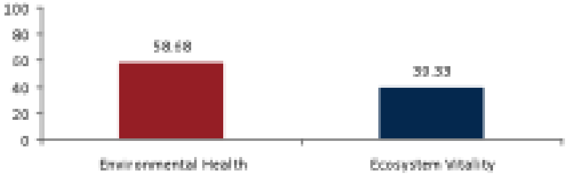
2010 ENVIRONMENTAL PERFORMANCE INDEX

Rank:	**121**
Score:	**49.0**
Income Group Average:	58.7
Geographic Group Average:	57.1

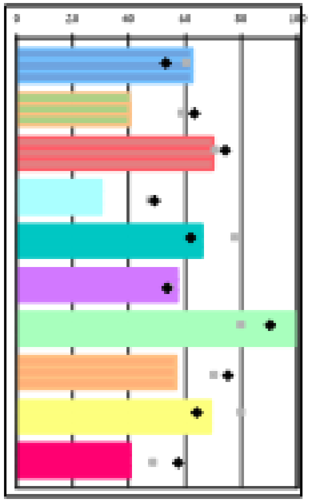
EAST ASIA AND THE PACIFIC

GDP/capita 2007 est. (PPP) $5,084
Income Decile 6 (1=high, 10=low)

Environmental objectives:

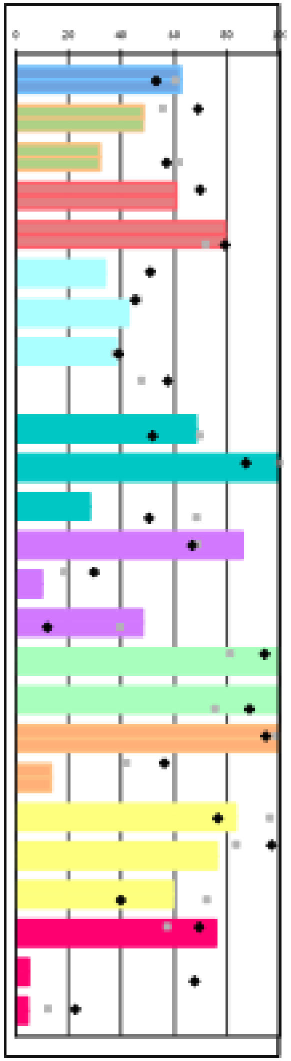


Policy Categories



	Country	◆ *Income Group*	■ *Geographic Group*
Environmental Burden of Disease (DALYs)	62.31	53.3	60.8
Air Pollution (impact on humans)	40.1	63.4	58.6
Water (impact on humans) *	70.0	74.5	70.7
Air Pollution (impact on ecosystem)	30.2	49.0	47.6
Water (impact on ecosystem) *	66.0	61.9	77.8
Biodiversity	57.2	53.7	54.4
Forestry	100.0	90.4	80.1
Fisheries	56.5	75.4	70.5
Agriculture	69.1	64.3	80.14
Climate Change *	40.2	57.3	48.6

Indicators



	Value	Target	Proximity to Target (100=target met)
DALY: Environmental Burden of Disease (DALY)	32.0	0	62.3
INDOOR: Indoor air pollution (%)	49.0	100	48.4
OUTDOOR: Outdoor air pollution (μg/m³)	73.0	100	31.7
ACSAT: Access to sanitation (%) *	65.0	100	60.72
WATSUP: Access to water (%)	88.0	100	79.3
SO2: Sulfur dioxide emissions (Gg/1000 sq km)	6.0	<= 0.01	33.5
NOX: Nitrogen oxides emissions (Gg/1000 sq km)	2.4	<= 0.01	42.4
NMVOC: Non-methane volatile organic compound emissions (Gg/1000 sq km)	2.8	<= 0.01	37.9
OZONE: Ecosystem ozone (ppb)	397710008.3	0	0.2
WQI: Water quality index *	68.0	100	68.0
WSI: Water scarcity index	0.0	0	100.0
WATSTR: Water stress index	19.6	0	27.9
PACOV: Biome protection (%)	8.6	>= 10	85.7
MPAEEZ: Marine protection (%)	0.3	>= 10	9.8
AZE: Critical habitat protection (%)	47.7	100	47.7
FORGRO: Growing stock change (ratio)	1.1	>=1	100.0
FORCOV: Forest cover change (%)	2.2	>=0	100.0
MTI: Marine trophic index (slope)	0.01	>=0	100.0
EEZTD: Trawling and dredging intensity (%)	86.9	0	13.1
AGWAT: Agricultural water intensity (%)	15.1	<=10	83.4
AGSUB: Agricultural subsidies (NRA)	0.1	0	76.1
AGPEST: Pesticide regulation	13.0	22	59.1
GHGCAP: Greenhouse gas emissions per capita including land use emissions (Mt CO2 eq) *	5.5	2.5	75.7
GHGIND: Industrial greenhouse gas emissions intensity(t CO2 per mill US$)	264.1	36.3	4.8
CO2KWH: CO2 emissions per electricity generation (CO2 per kWh) *	757.8	0	4.4

Germany

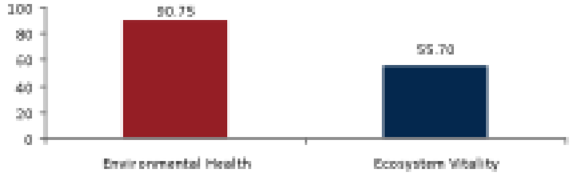
EUROPE

GDP/capita 2007 est. (PPP) $33,181
Income Decile 2 (1=high, 10=low)

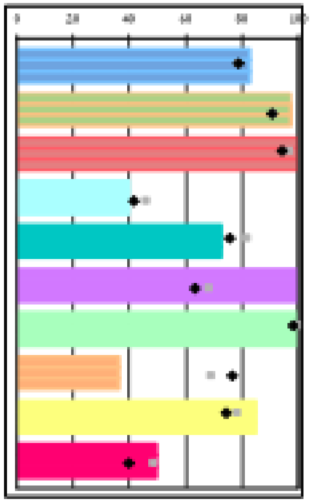
2010 ENVIRONMENTAL PERFORMANCE INDEX

Rank:	**17**
Score:	**73.2**
Income Group Average:	66.1
Geographic Group Average:	71.5

Environmental objectives:

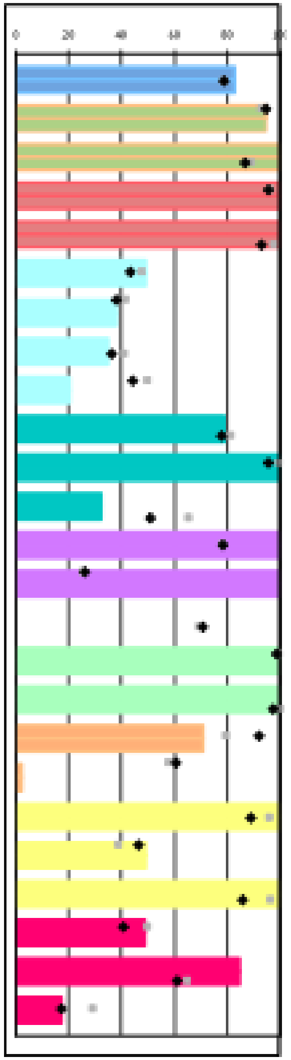


Policy Categories



	Country	◆ *Income Group*	■ *Geographi Group*
Environmental Burden of Disease (DALYs)	82.61	78.7	78.7
Air Pollution (impact on humans)	97.4	90.8	91.3
Water (impact on humans) *	100.0	94.3	97.1
Air Pollution (impact on ecosystem)	40.0	41.5	45.9
Water (impact on ecosystem) *	72.4	75.7	82.0
Biodiversity	100.0	63.1	68.0
Forestry	100.0	98.3	99.8
Fisheries	36.4	76.4	68.8
Agriculture	84.8	74.3	78.5
Climate Change *	49.6	39.9	48.6

Indicators



	Value	Target	Proximity to Target (100=target met)
DALY: Environmental Burden of Disease (DALY)	17.0	0	82.8
INDOOR: Indoor air pollution (%)	5.0	100	94.7
OUTDOOR: Outdoor air pollution (µg/m^3)	18.6	100	100.0
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)	1.4	<= 0.01	48.9
NOX: Nitrogen oxides emissions (Gg/1000 sq km)	3.6	<= 0.01	37.9
NMVOC: Non-methane volatile organic compound emissions (Gg/1000 sq km)	3.6	<= 0.01	35.2
OZONE: Ecosystem ozone (ppb)	7526200.3	0	20.2
WQI: Water quality index *	78.6	100	78.6
WSI: Water scarcity index	0.0	0	100.0
WATSTR: Water stress index	15.9	0	32.5
PACOV: Biome protection (%)	10.0	>= 10	100.0
MPAEEZ: Marine protection (%)	14.2	>= 10	100.0
AZE: Critical habitat protection (%)	..	100	..
FORGRO: Growing stock change (ratio)	1.2	>=1	100.0
FORCOV: Forest cover change (%)	0.0	>=0	100.0
MTI: Marine trophic index (slope)	-0.01	>=0	70.6
EEZTD: Trawling and dredging intensity (%)	97.9	0	2.1
AGWAT: Agricultural water intensity (%)	0.7	<=10	100.0
AGSUB: Agricultural subsidies (NRA)	0.1	0	49.2
AGPEST: Pesticide regulation	22.0	22	100.0
GHGCAP: Greenhouse gas emissions per capita including land use emissions (Mt CO2 eq) *	12.1	2.5	48.5
GHGIND: Industrial greenhouse gas emissions intensity(t CO2 per mil US$)	50.5	36.3	84.3
CO2KWH: CO2 emissions per electricity generation (CO2 per kWh) *	426.7	0	17.1

United States of America

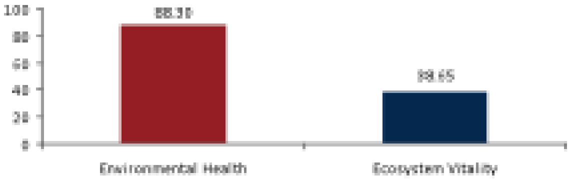
2010 ENVIRONMENTAL PERFORMANCE INDEX

Rank:	**61**
Score:	**63.5**
Income Group Average:	67.1
Geographic Group Average:	65.0

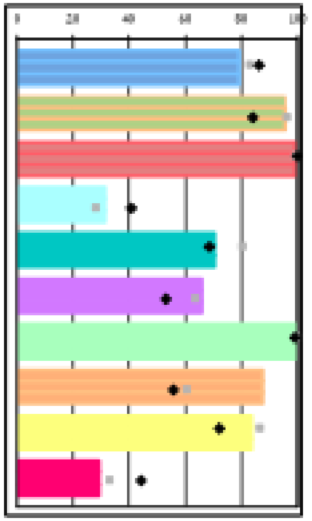
NORTH AMERICA

GDP/capita 2007 est. (PPP) $43,102
Income Decile 1 (1=high, 10=low)

Environmental objectives:

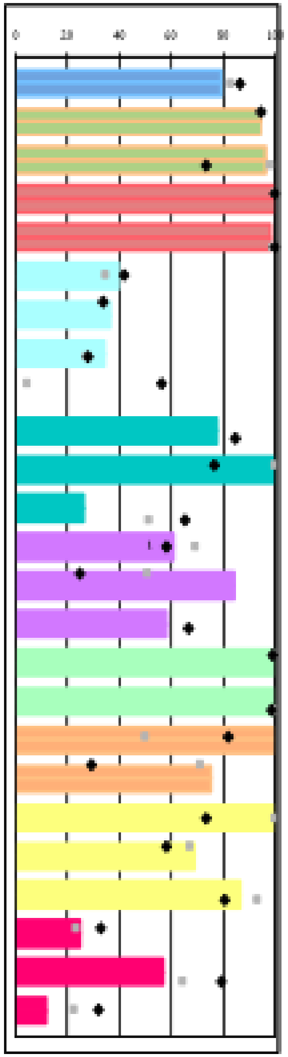


Policy Categories



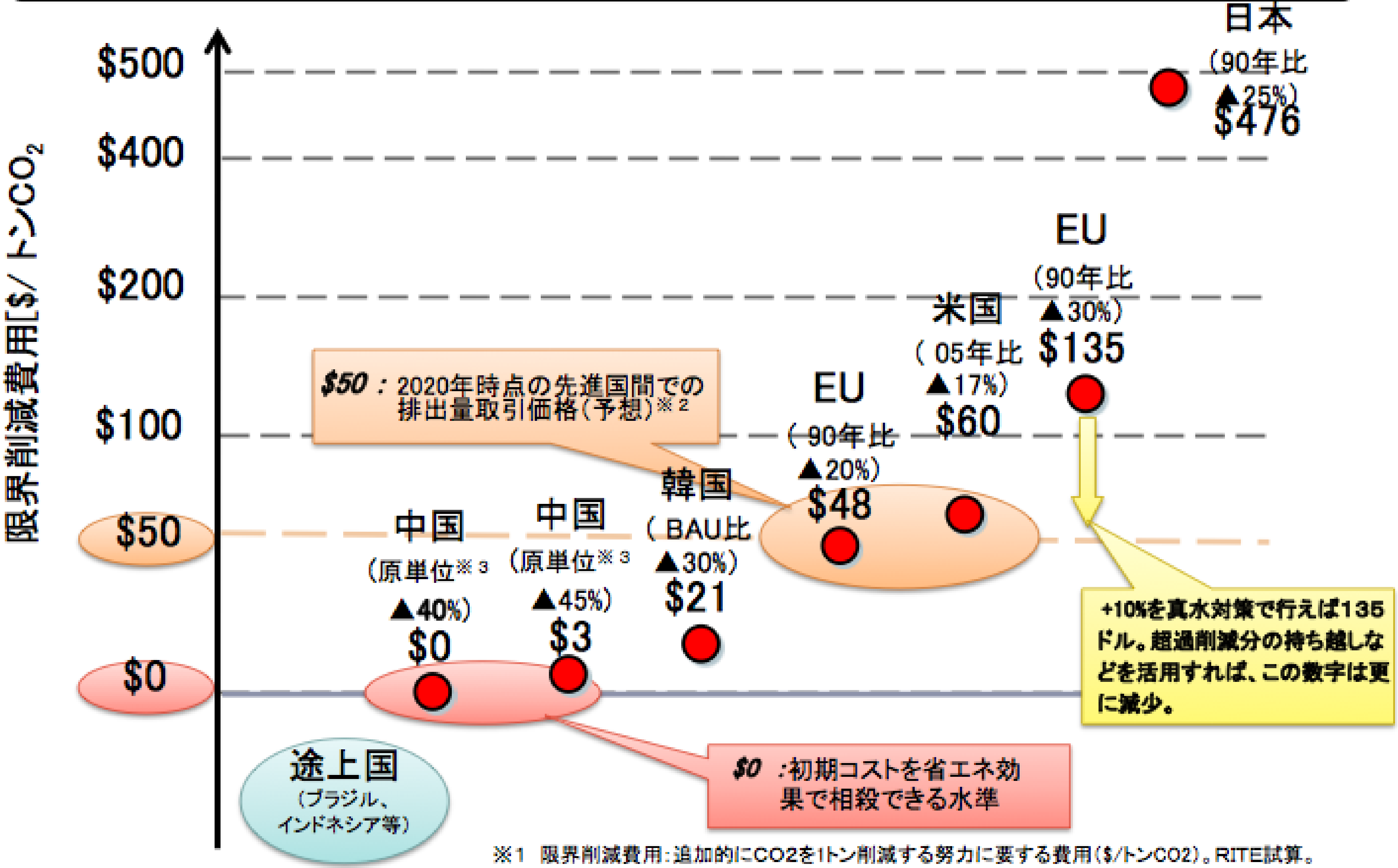
	Country	◆ *Income Group*	■ *Geographic Group*
Environmental Burden of Disease (DALYs)	79.2	86.3	83.0
Air Pollution (impact on humans)	95.7	84.0	96.5
Water (impact on humans) *	99.1	99.9	99.6
Air Pollution (impact on ecosystem)	31.6	40.7	28.4
Water (impact on ecosystem) *	70.2	68.4	80.5
Biodiversity	65.9	53.1	63.9
Forestry	100.0	99.0	100.0
Fisheries	87.6	55.8	60.7
Agriculture	83.8	72.2	86.67
Climate Change *	29.4	44.3	33.4

Indicators



	Value	Target	Proximity to Target (100=target met)
DALY: Environmental Burden of Disease (DALY)	19.0	0	79.2
INDOOR: Indoor air pollution (%)	5.0	100	94.7
OUTDOOR: Outdoor air pollution (ug/m³)	21.3	100	96.6
ACSAT: Access to sanitation (%)*	100.0	100	100.0
WATSUP: Access to water (%)	99.0	100	98.3
SO2: Sulfur dioxide emissions (Gg/1000 sq km)	3.3	<= 0.01	39.6
NOX: Nitrogen oxides emissions (Gg/1000 sq km)	4.1	<= 0.01	36.5
NMVOC: Non-methane volatile organic compound emissions (Gg/1000 sq km)	3.9	<= 0.01	34.2
OZONE: Ecosystem ozone (ppb)	940241961.0	0	0.0
WQI: Water quality index *	77.5	100	77.5
WSI: Water scarcity index	0.0	0	100.0
WATSTR: Water stress index	21.3	0	26.0
PACOV: Biome protection (%)	6.1	>= 10	60.8
MPAEEZ: Marine protection (%)	6.5	>= 10	84.2
AZE: Critical habitat protection (%)	57.9	100	57.9
FORGRO: Growing stock change (ratio)	1.0	>=1	100.0
FORCOV: Forest cover change (%)	0.1	>=0	100.0
MTI: Marine trophic index (slope)	0.0	>=0	100.0
EEZTD: Trawling and dredging intensity (%)	24.9	0	75.1
AGWAT: Agricultural water intensity (%)	6.4	<=10	100.0
AGSUB: Agricultural subsidies (NRA)	0.1	0	68.8
AGPEST: Pesticide regulation	19.0	22	86.4
GHGCAP: Greenhouse gas emissions per capita including land use emissions (Mt CO2 eq) *	23.1	2.5	24.7
GHGIND: Industrial greenhouse gas emissions intensity() CO2 per mill US$)	90.2	36.3	56.6
CO2KWH: CO2 emissions per electricity generation (CO2 per kWh) *	549.4	0	11.5

限界削減費用（※1）による各国の目標値比較



$50：2020年時点の先進国間での排出量取引価格（予想）※2

+10%を真水対策で行えば135ドル。超過削減分の持ち越しなどを活用すれば、この数字は更に減少。

$0：初期コストを省エネ効果で相殺できる水準

※1 限界削減費用：追加的にCO2を1トン削減する努力に要する費用（$/トンCO2）。RITE試算。
※2 IEA（国際エネルギー機関）の450ppm安定化シナリオ（2050年までに世界半減））による。
※3 中国の目標は2005年比でGDP原単位を▲40%～▲45%削減。

出典：経済産業省　http://www.meti.go.jp/policy/energy_environment/global_warming/index.html

Latest Policy Measures (for Climate Change)

-We need to reduce global emissions by 19 Gigatonnes (Gt) in 2020 and energy-related emissions by 48 Gt by 2050

Power: Approximately 38% of total savings to 2050. Renewable energy, carbon capture and sequestration (CCS), nuclear power and biomass will all be critical areas.
Transport: Approximately 26% of total savings to 2050. key technologies include electric and hydrogen fuel cell vehicles, improved efficiency and current and next generation biofuels.
Buildings: Approximately 17% of total savings to 2050. key technologies include improved efficiency in building appliances.
Industry: Approximately 19% of total savings to 2050. key technologies include CCS for industrial processes, and industrial motor systems.

-Implementing just **seven proven policies** can deliver these reductions – but need scaling up

1)**Renewable energy standards**: Regulation to require or feed-in tariffs to stimulate an increased production of energy from renewable sources, in particular wind and solar, could deliver 2.1 Gt of savings.
2)**Industry efficiency**: improved motors and other efficiency gains could deliver 2.4Gt of savings.
3)**Building codes**: improving standards for new build and modernising existing building stock saves 1.3 Gt.
4)**Vehicle efficiency standards**: driving up standards for vehicle efficiency could save 0.4 Gt.
5)**Fuel carbon content standards:** Reducing the carbon content of fuels could lead to 0.3 Gt of savings.
6)**Appliance standards:** increasing the energy efficiency of white goods and other appliances could reduce emissions by 0.3 Gt.
7)**Policies to reduce emissions from deforestation and forest degradation (REdd)**: could deliver close to 9 Gt of reductions.

-In the longer term, we need technologies such as

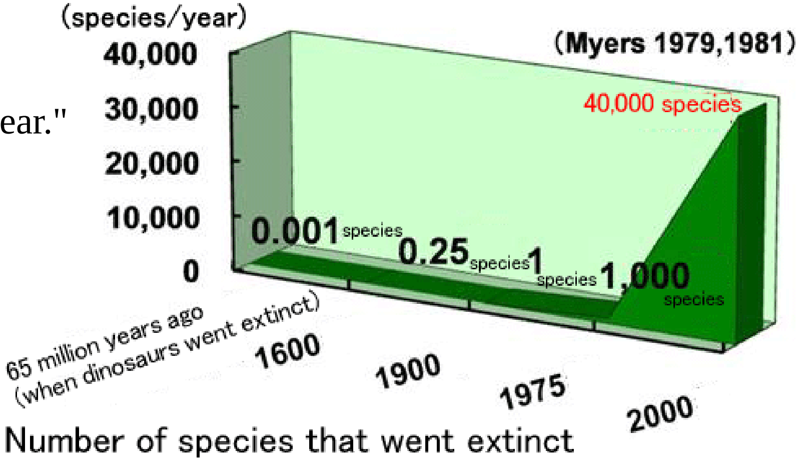
Carbon capture and storage (CCS)
Expanded nuclear power, new generations of solar energy, etc.

Reference: The Climate Group, “Breaking the Climate Deadlock” project
'Technology for a Low Carbon
Future’http://www.theclimategroup.org/what_we_do/breaking_the_climate_deadlock/

Latest Policy Measures (for Biodiversity)

- Convention on Biological Diversity

  - Status: "about 40,000 species go extinct every year."



- TEEB Report

Net Present Value (NPV) of annual Natural Capital loss
as a result of forest loss is between
EUR 1.35 trillion - EUR 3.1 trillion
(US$ 2.0 trillion - US$ 4.5 trillion)

The Strategic Plan of the Convention on Biological Diversity or the “Aichi Target”, adopted by the meeting includes 20 headline targets, organized under five strategic goals that address the underlying causes of biodiversity loss, reduce the pressures on biodiversity, safeguard biodiversity at all levels, enhance the benefits provided by biodiversity, and provide for capacity-building.

Among the targets, it is important to note that Parties:

- Agreed to at least halve and where feasible bring close to zero the rate of loss of natural habitats including forests;

-Established a target of 17 per cent of terrestrial and inland water areas and 10 per cent of marine and coastal areas;

-Through conservation and restoration, Governments will restore at least 15 percent of degraded areas; and

-Will make special efforts to reduce the pressures faced by coral reefs.

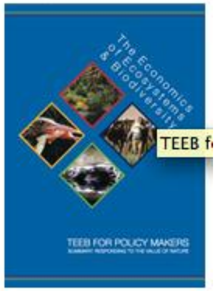
Parties also agreed to a substantial increase in the level of financial resources in support of implementation of the Convention.

Reference: COP10 2010

http://cop10.jp/aichi-nagoya/english/cop/cop.html

The Economics of Ecosystem & Biodiversity

5 Suggestion for National and International Policy Makers



1. Reward benefits through payments and markets.

Payments for ecosystem services (PES schemes) can be local up to global. Product certification, green public procurement, standards, labelling and voluntary actions provide additional options for greening the supply chain and reducing impacts on natural capital.

2. Reform environmentally harmful subsidies.

Global subsidies amount to almost US$ 1 trillion per year for agriculture, fisheries, energy, transport and other sectors combined. Up to a third of these are subsidies supporting the production and consumption of fossil fuels. Reforming subsidies that are inefficient, outdated or harmful makes double sense during a time of economic and ecological crisis.

3. Address losses through regulation and pricing.

Many threats to biodiversity and ecosystem services can be tackled through robust regulatory frameworks that establish environmental standards and liability regimes. These are already tried and tested and can perform even better when linked to pricing and compensation mechanisms based on the ‘polluter pays’ and ‘full cost recovery’ principles – to alter the status quo which often leaves society to pay the price.

4. Add value through protected areas.

The global protected area network covers around 13.9% of the Earth’s land surface, 5.9% of territorial seas and only 0.5% of the high seas: nearly a sixth of the world’s population depend on protected areas for a significant percentage of their livelihoods. Increasing coverage and funding, including through payment for ecosystem services (PES) schemes, would leverage their potential to maintain biodiversity and expand the flow of ecosystem services for local, national and global benefit.

5. Invest in ecological infrastructures.

This can provide cost-effective opportunities to meet policy objectives, e.g. increased resilience to climate change, reduced risk from natural hazards, improved food and water security as a contribution to poverty alleviation. Up-front investments in maintenance and conservation are almost always cheaper than trying to restore damaged ecosystems. Nevertheless, the social benefits that flow from restoration can be several times higher than the costs.

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