Eco・Sophia Symposium 2010.12.4

Ecological Problems in China

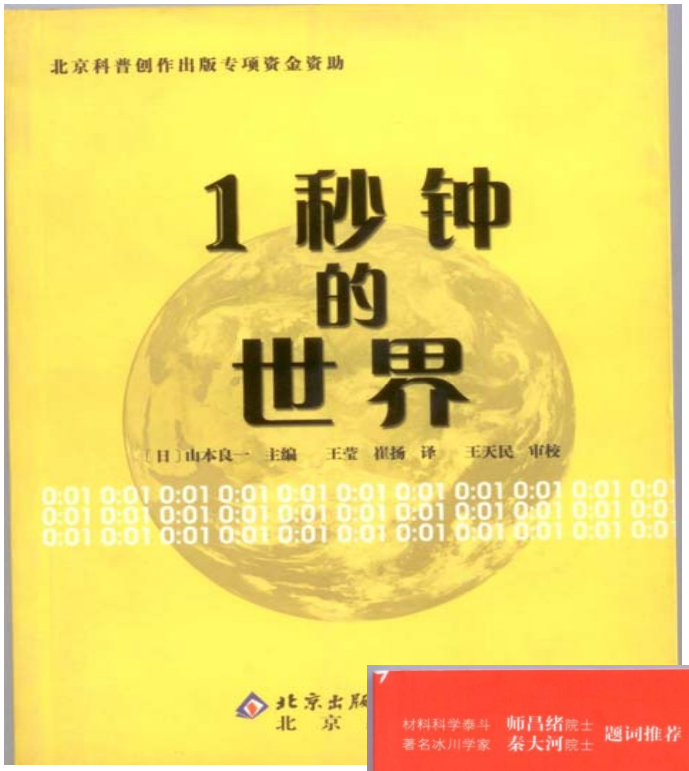
Ryoichi YAMAMOTO
Professor Emeritus of the University of TOKYO
Chair of IGPN

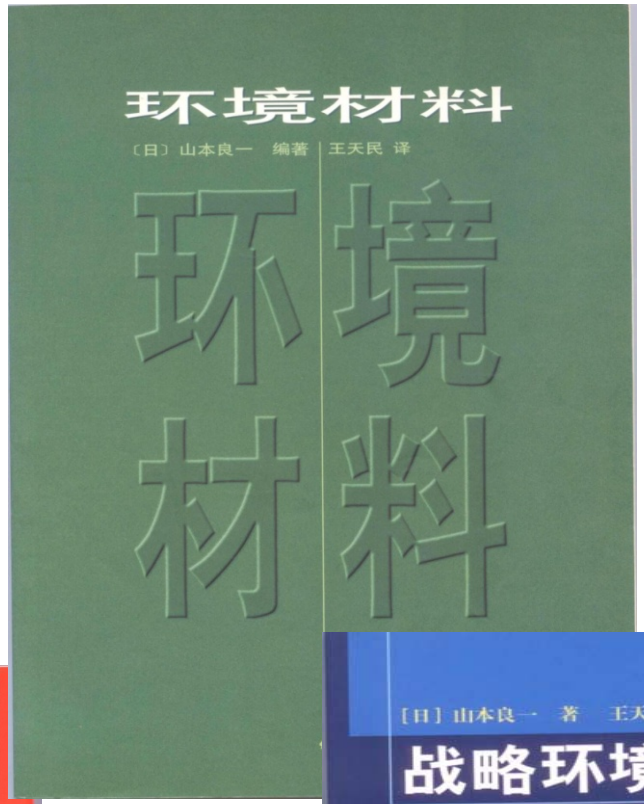
山本良一教授在中国的足迹——从1983年到2010年的28年间，山本良一教授曾访问中国68次。

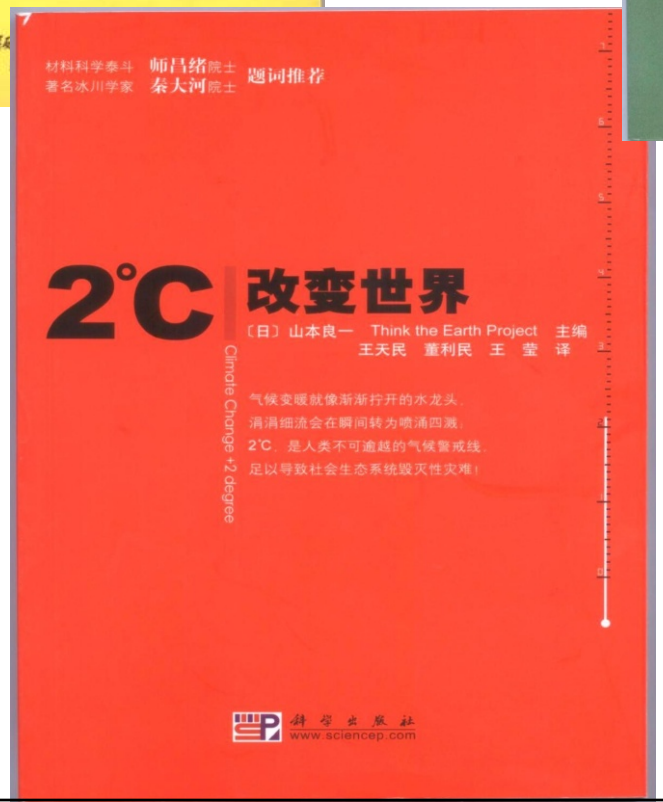
密切的學術交往：在30所中國大學中歷任名譽、客座、顧問、教授。

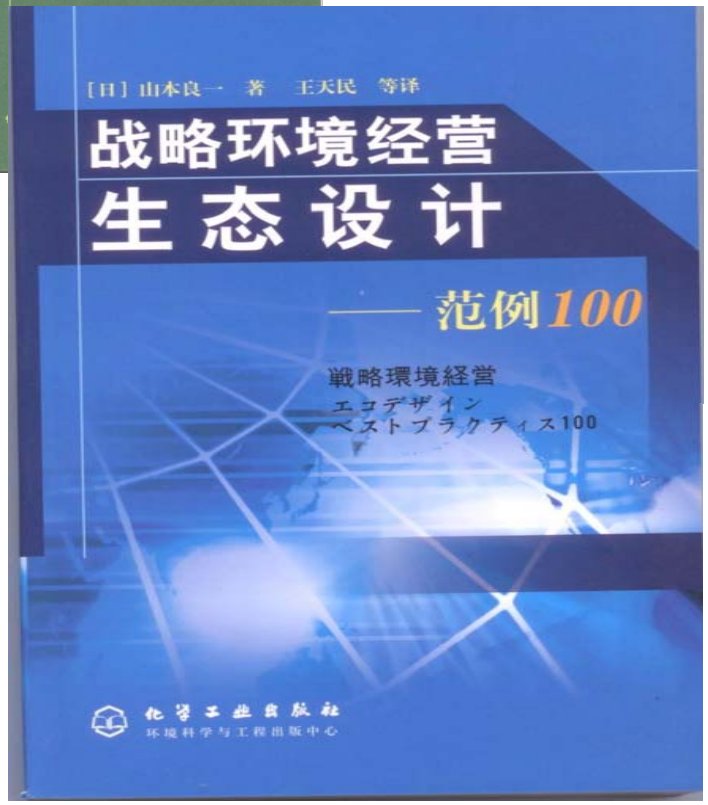
1.蘭州大學；2.中國科技大學；3.浙江大學；4.西安交通大學；5.北京大學；6.四川大學；7.吉林大學；8.中山大學；9.南京大學；10.上海科技大學；11.江蘇理工大學；12.武漢工業大學；13.華中理工大學；14.重慶大學；15.南昌大學；16.曲阜師範大學；17.北京工業大學；18.上海交通大學；19.復旦大學；20.同濟大學；21.上海大學；22.北京航空航天大學；23.清華大學；24.東南大學；25.南京工業大學；26.天津大學；27.青島大學；28.中南大學；29.雲南大學；30.東北大學，31.太原理工大學，32.**江蘇科学技術**大學

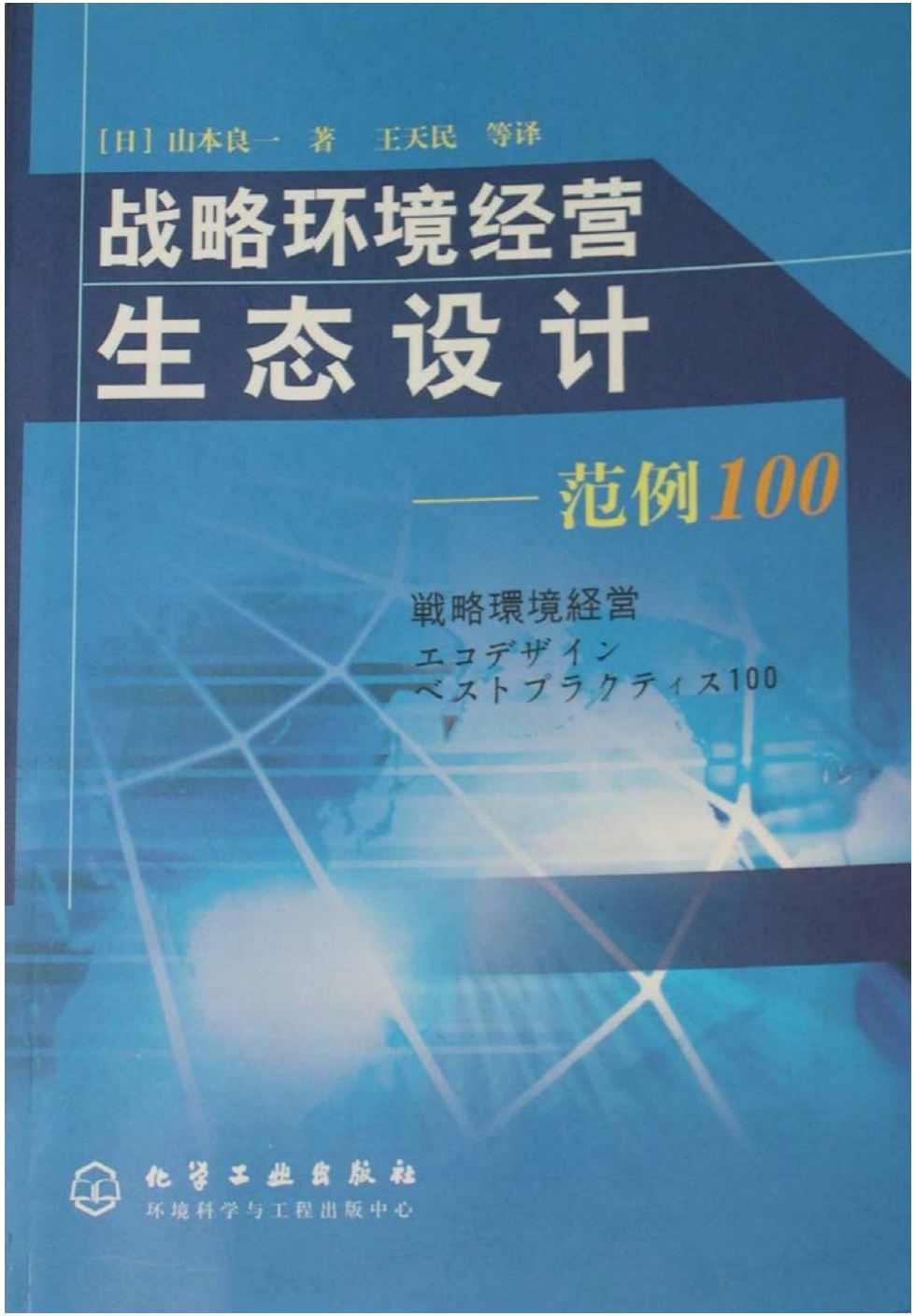
Chinese version of my four books











1500 copies were donated to 50 Chinese Universities

by Dr. Xu Kaihtua

Invited Chinese materials scientists to the Ecomaterial Symposium, September 1993

氏名	所属	氏名	所属
師昌緒	中国国家自然科学基金委員会副主任	金志浩	西安交通大学材料科学系主任、教授
李恒徳	中国MRS会長、精華大学教授	張国定	上海交通大学材料系主任、教授
曽漢民	中山大学学長	張其瑞	浙江大学物理系教授
王義遒	北京大学副学長	陳兆甲	中国科学技術大学物理系主任、教授
謝立	南京大学副学長	宋余九	西安交通大学材料科学系教授
倪維斗	精華大学副学長	郝士明	東北大学材料科学系主任、教授
欧陽世翕	武漢工業大学副学長	王天民	蘭州大学材料系主任、教授
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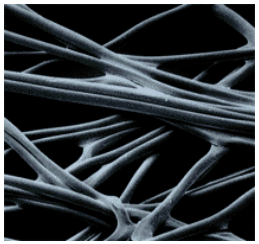
鄒依依	中国科学院上海治金研究所所長	熊光成	北京大学物理系教授
方容川	中国科学技術大学教授	肖定全	四川大学材料科学系主任、教授
柳百新	精華大学材料科学系副主任、教授	曹澤淳	上海科学技術大学材料科学系教授
陳国良	北京科学技術大学材料科学系主任、教授	袁銀男	江蘇工学院助教授
宗祥富	復旦大学材料科学系主任、教授	呂世宗	台湾環境保護学会理事長
姜漢成	吉林大学材料科学系主任、教授		

1993 MRS The First Ecomaterial Symposium Chinese invited speakers

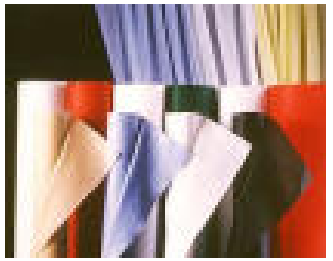
Examples of Eco-material

Aspac Sarasara™



Bemberg™

HI-ZEX



Non-woven Fabric for Sanitary Articles

Ecology α Yupo

Banana Paper

Soybean oil ink

Biodegradable oil (Bio Green Grass)

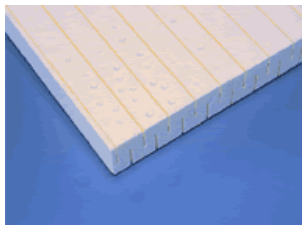
Toyota TSOP

Sumitomo TPE

Corrosion resistant pipe fittings

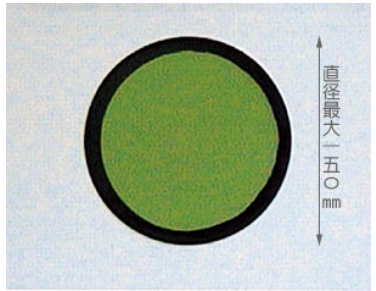
Prearmour

EcoTire DNA Series



Styropor JFN

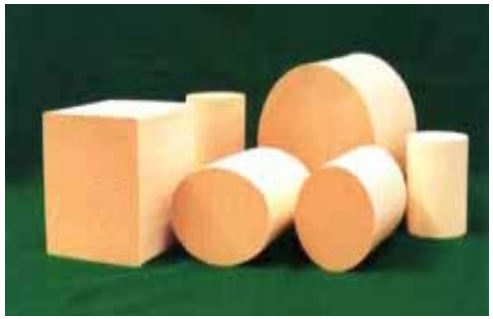
Suntec™ coating powder



Solid-Oxide Fuel Cells

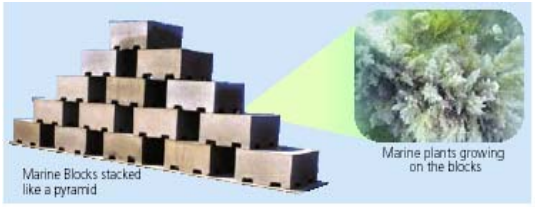
Examples of Eco-material

CARBOFIT



CERACAT™

Boneceram



Marine Blocks

Ultra High Strength Steel Sheet

Lead-free steel sheet

Folium®

M-Wood

Eco soil ceramics

Lead-free lens

Lead-free copper alloy Ecobrass

Hydrogen absorbing alloy powder

Solar cell module

TULC® (Toyo Ultimate Can)

Global Change in One Second

edited by Ryoichi YAMAMOTO (DIAMOND Co. 2003)

Per second ・・・・・・・

- **390,000 cubic meters of CO2 are emitted,**
- **1,629 cubic meters of glaciers in Greenland melt,**
- **710 tons of oxygen are decreasing from the atmosphere,**
- **2,300 square meters of arable land disappear,**
- **3 cattle, 7 pigs and 1,100 chickens are consumed, the meat production sums up to 6.9 tons,**
- **5100 square meters of natural forest disappear**
- **1.3 motorcars, 4.2 television are produced,**
- **532 peoples go to Macdonald and consume more than 500 hamburgers,**
- **population increases by 2.4 persons (200,000 persons per day), ・・・**

“How to make the step from the industrial Economy to the Dematerialized Service Economy”

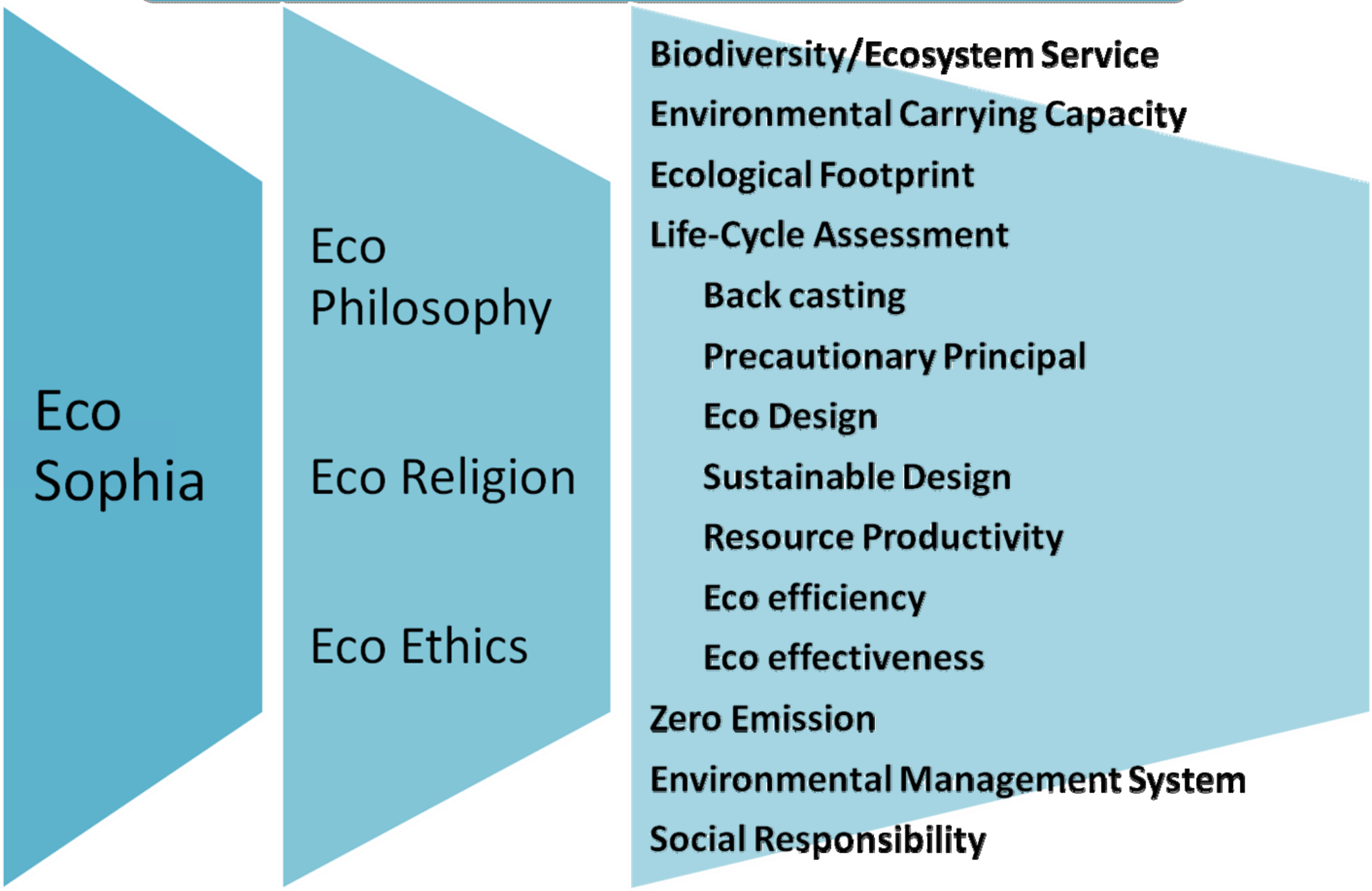
- Attaching greater importance to the utility value of products rather than their exchange value.
- Attaching greater importance to maximizing the functional utility of products.
- Endeavoring to maximize system functions on a long-term basis.
- Manufacturers have to change their business model in the sense of selling functions, performance and results rather products.
- The product is a service-providing instrument and the service it provides must be its ultimate luxury.
- We have to change our relation to the product from owning it to benefiting from its service, in other words, from ownership to usership.
- We need to get away from an economy focusing on the consumption of “things” to one that focuses on the consumption of “services.”
- We need to reduce environmental impact through IT and develop high-quality digital goods.
- We need to provide high-quality public services (education, medical care, security, parks, amusement/entertainment, etc.)
- Taxation and subsidies have to give a green content.

Proposition: We need to make further progress in getting away from a material-centered economy (reducing the volume of resource and the amount of materials and energy we consume)

Major Concepts and Methodologies proposed for SD

Japan	EU	USA/Canada
Product Assessment (1990s)	Precautionary Principles (1970s)	Life Cycle Assessment (1970s)
Ecomaterials (1991, Yamamoto et al)	Eco-Balance (1970s, Muller-Wenk)	CSR/SRI (1970s)
Inverse Manufacturing (1994, Yoshikawa et al)	Environmental Space (1980s)	Toxic Release Inventory (1986, US-EPA)
Zero Emission (1994, UNU)	Polluter Pays Principles (1984)	Responsible Care (1987)
Green Productivity (1994, APO)	Four System Conditions (1987, TNS)	Green Design (1990s)
Green Purchasing (1996)	Resource Productivity (1989, Wuppertal)	Functional Economy (1990s)
Eco-town (1997)	Eco-tax (1989)	Green Chemistry (1991)
Eco-product exhibition (1999)	Eco-efficiency (1992, WBCSD)	Ecological Footprint (1994)
	Factor 4 / Factor 10 (1993)	Industrial Ecology (1994,Graedel et al)
	EMAS, ISO 14000s (1993, 1997)	Natural Capitalism (2001)
	Circular Economy (1996, German Law)	
	Eco-design (1997, UNEP manual)	
	Product-Service System (1997)	
	Triple Bottom Line (1998, Elkington)	
	Integrated Product Policy (1999)	

Great Transformation for Ecological Civilization



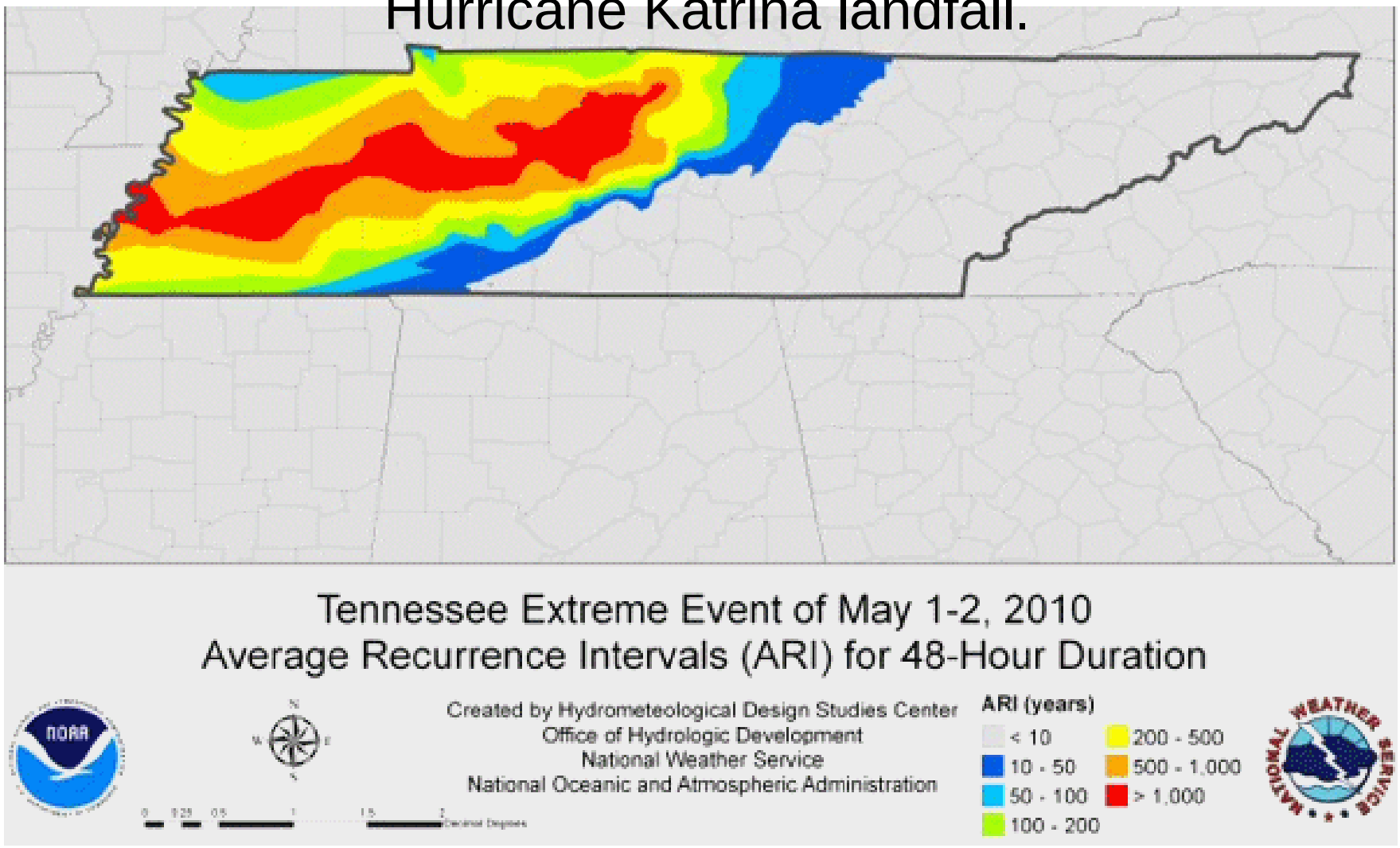
Extreme Weather in 2010

"While a longer time range is required to establish whether an individual event is attributable to climate change, **the sequence of current events matches IPCC predictions**" the WMO said.

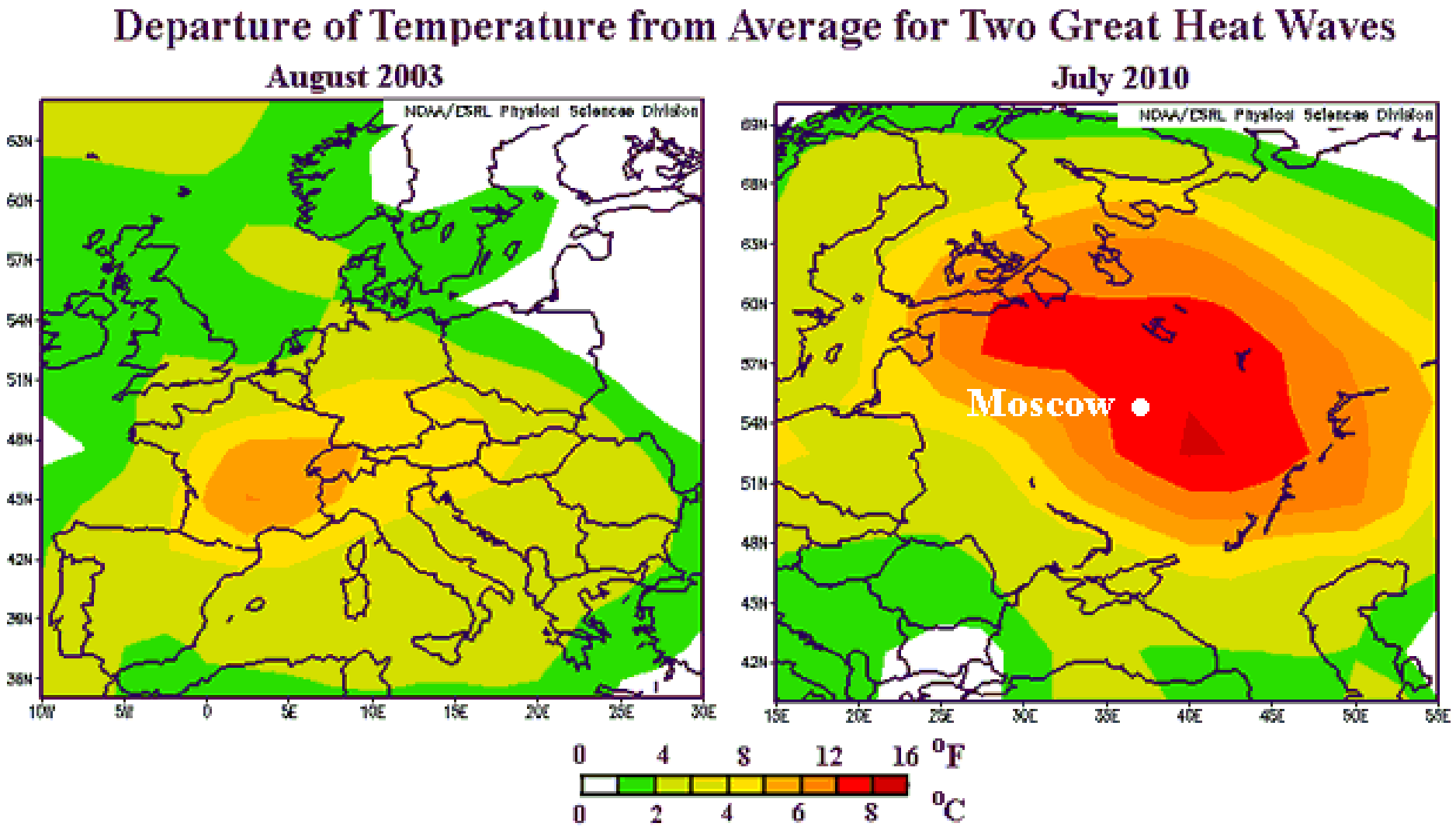
- The record heatwave and wildfires in Russia,
- Monsoonal flooding in Pakistan,
- Rain – induced landslides in China,
- Calving of a large iceberg from the Greenland ice sheet,
- Droughts and wildfires in Australia,
- A record number of high temperature days in the eastern USA NASA reports hottest January – Jury, 2010 on record

Stunning NOAA map of Tennessee's 1000-year deluge **May 1-2, 2010**

15 sites had rainfall exceeding maximum associated with Hurricane Katrina landfall.



Russian Meteorological Center:
“There was nothing similar to this on the territory of Russia during the last one thousand years in regard to the heat.”

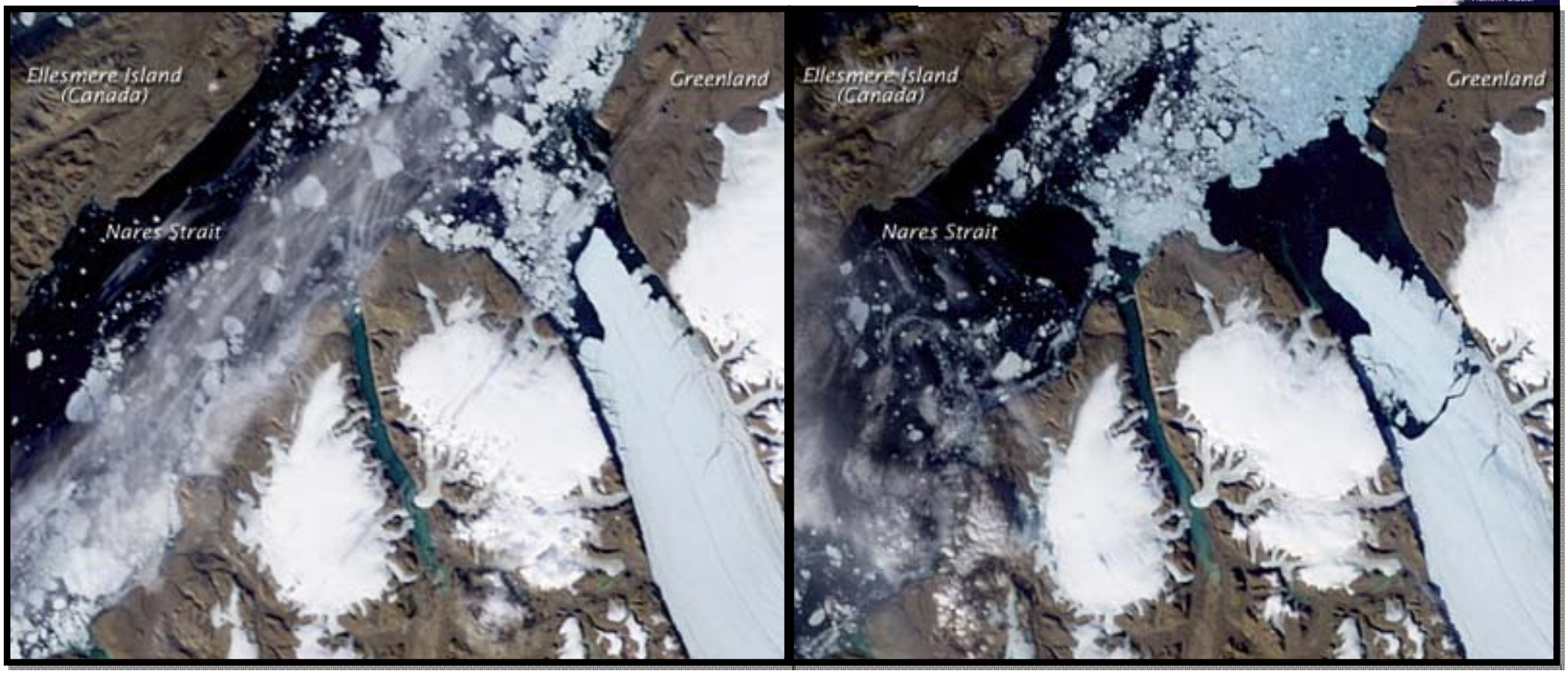


Huge iceberg breaks off Greenland glacier

Ice Island Calves off Petermann Glacier

Image acquired July 28, 2010.

Image acquired Aug. 5, 2010.



Source: NASA

Source: boston.com

Pakistan Floods

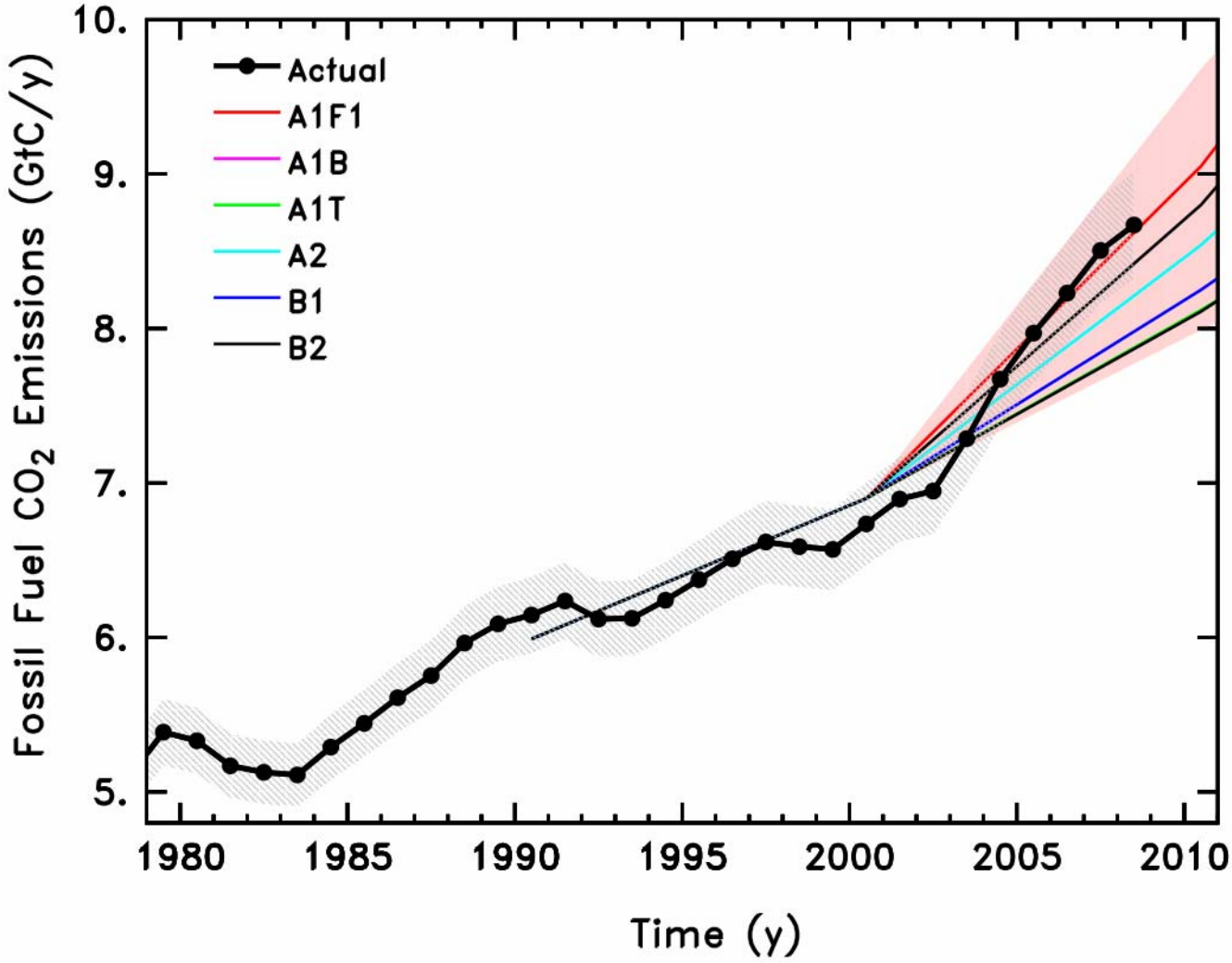
A man marooned by flood waters, alongside his livestock, waves towards an Army helicopter for relief handouts in the Rajanpur district of Pakistan's Punjab province on August 9, 2010.

Source: boston.com

Pakistan Floods

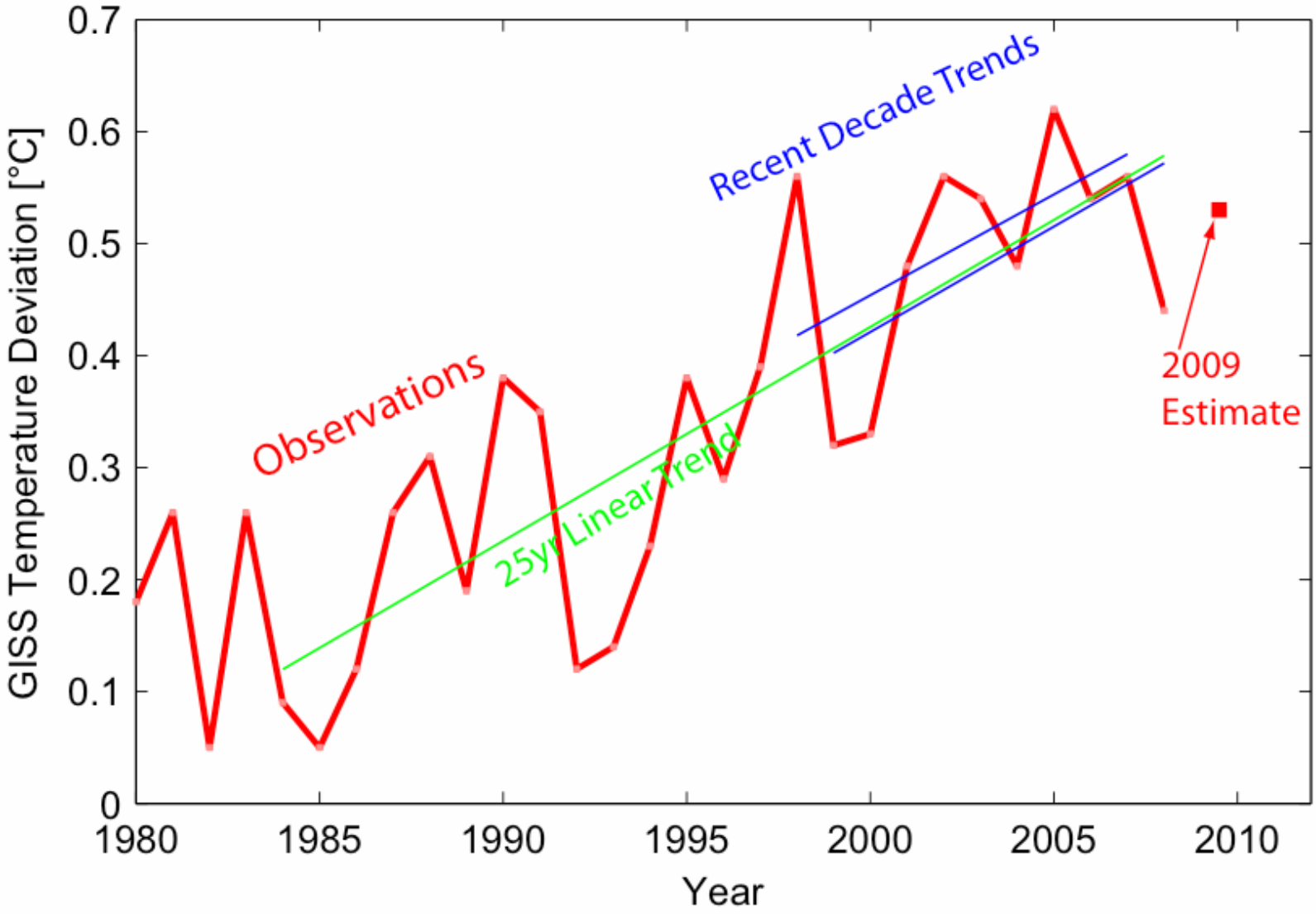
A man wades through flood waters towards a naval boat while evacuating his children in Sukkur, located in Pakistan's Sindh province August 8, 2010

Observed global CO_2 emissions from fossil Fuel burning and cement production

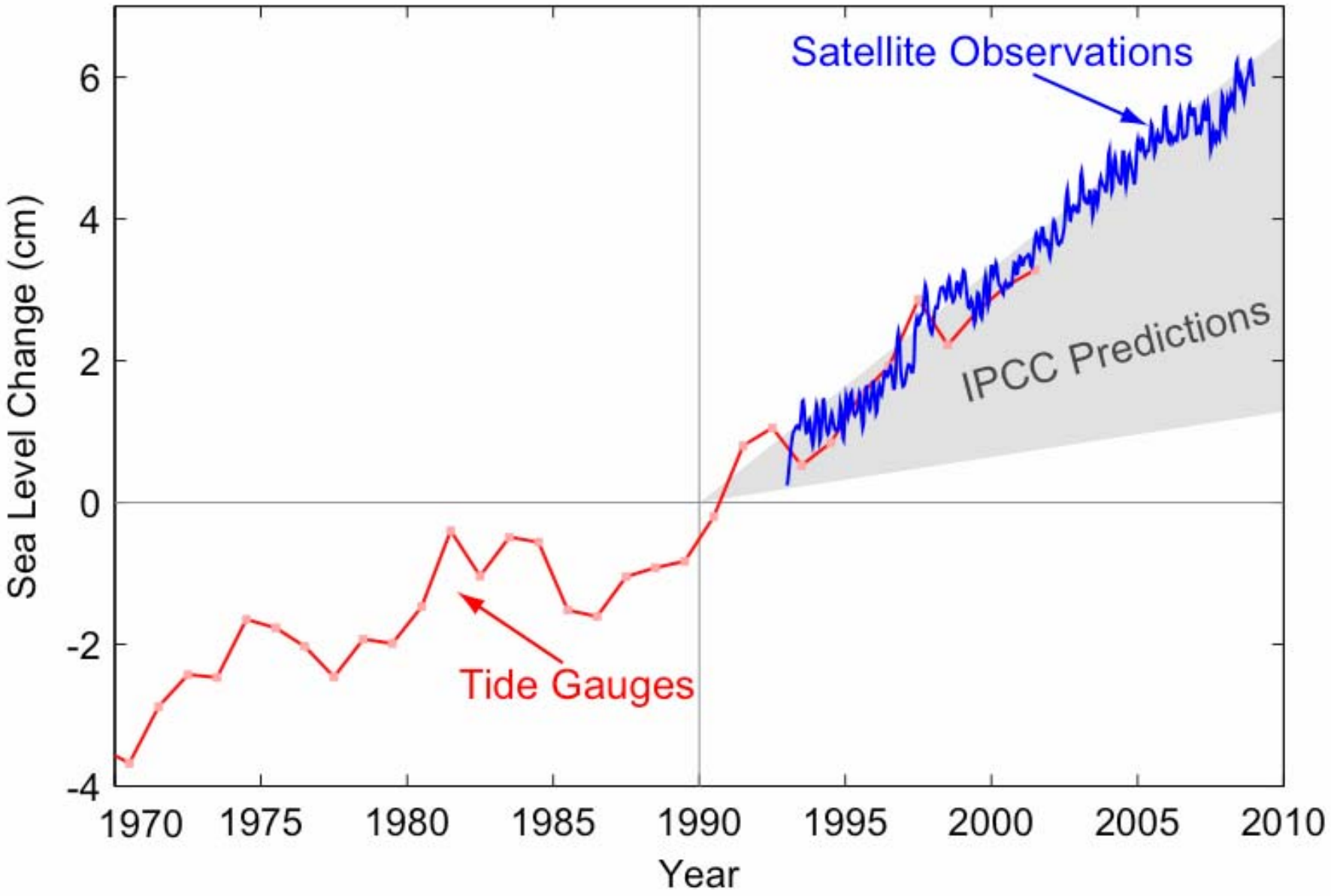


The Copenhagen Diagnosis, 2009

Global temperature according to NASA GISS date



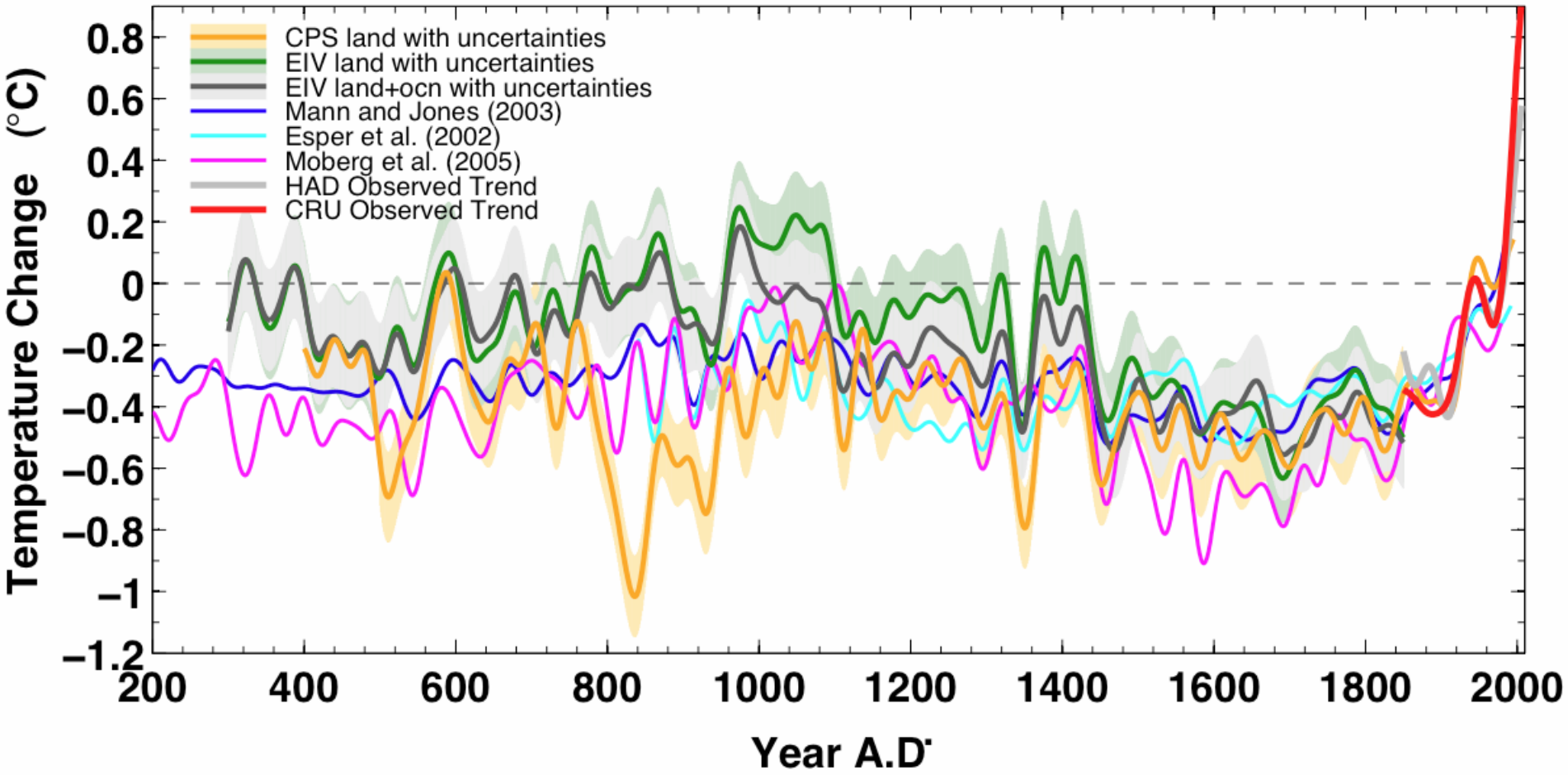
The Copenhagen Diagnosis, 2009



Sea level change

The Copenhagen Diagnosis, 2009

Comparison of various Northern Hemisphere temperature reconstruction



The Copenhagen Diagnosis, 2009

4℃global warming: regional patters and timing

by Richard Betts et al, Met Office, Hadley Centre

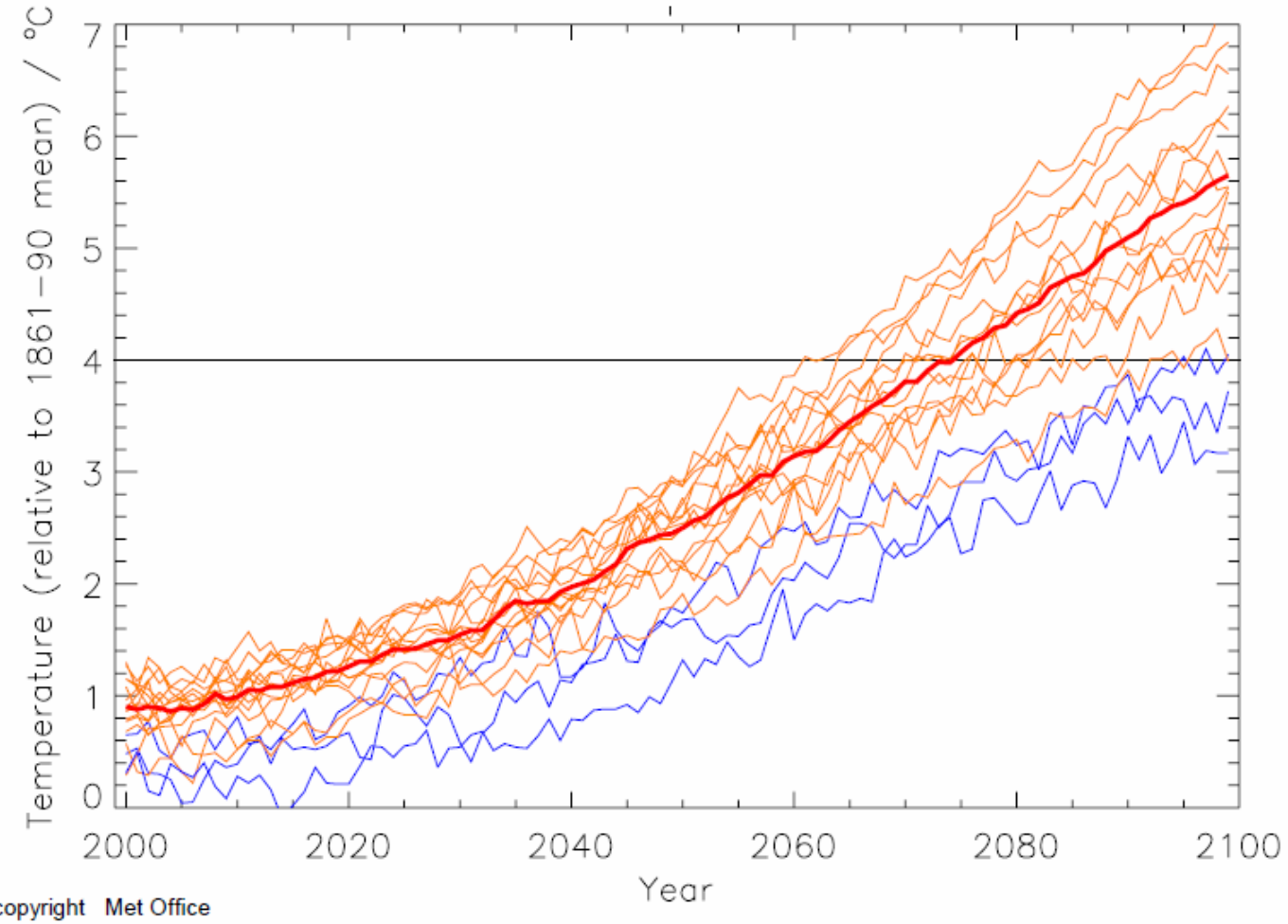
- CurrentCO2 emissions are near（but not above）upper end of IPCC
- 4℃ global warming（relative to pre-industrial）is possible by the 2090s,especially under high emissions scenario
- Many areas could warm by 10 ℃ or more
- The Arctic could warm by 15 ℃ or more
- Annual precipitation could decrease by 20%or more in many areas
- Carbon cycle feed backs expected to accelerate warming
- Plausible worst case:：4 ℃ by 2060

Plausible Worst Case; 4°C by 2060

Richard Betts,Mike Sanderson,Debbie Hemming,
Mark New,Jason Lowe,Chris Jones

Met Office
Hadley Centre

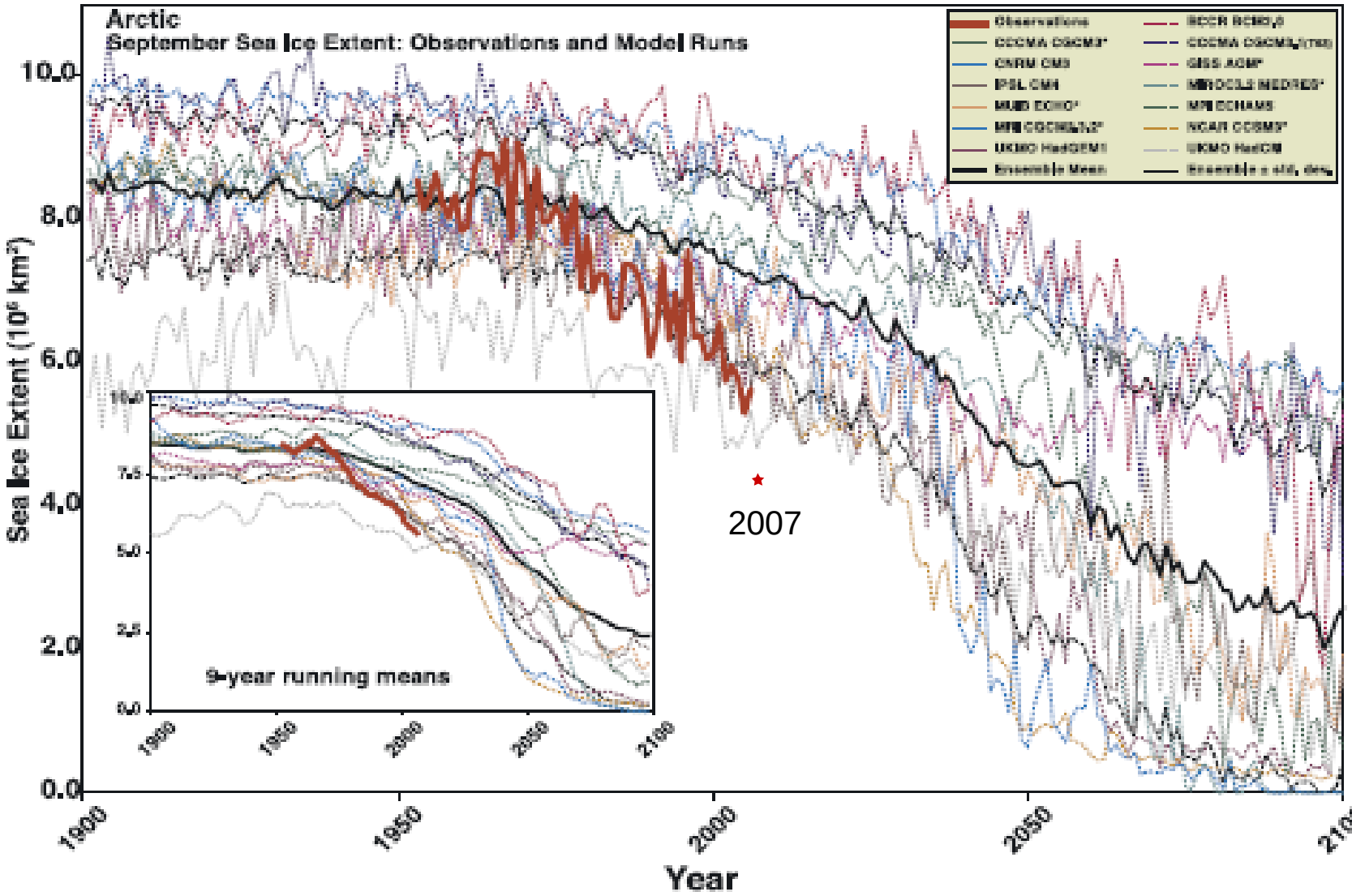
Global warming with A1FI scenario: MOHC ensemble



Arctic Sea Ice Decline: Faster Than Forecast

Julienne Stroeve et al

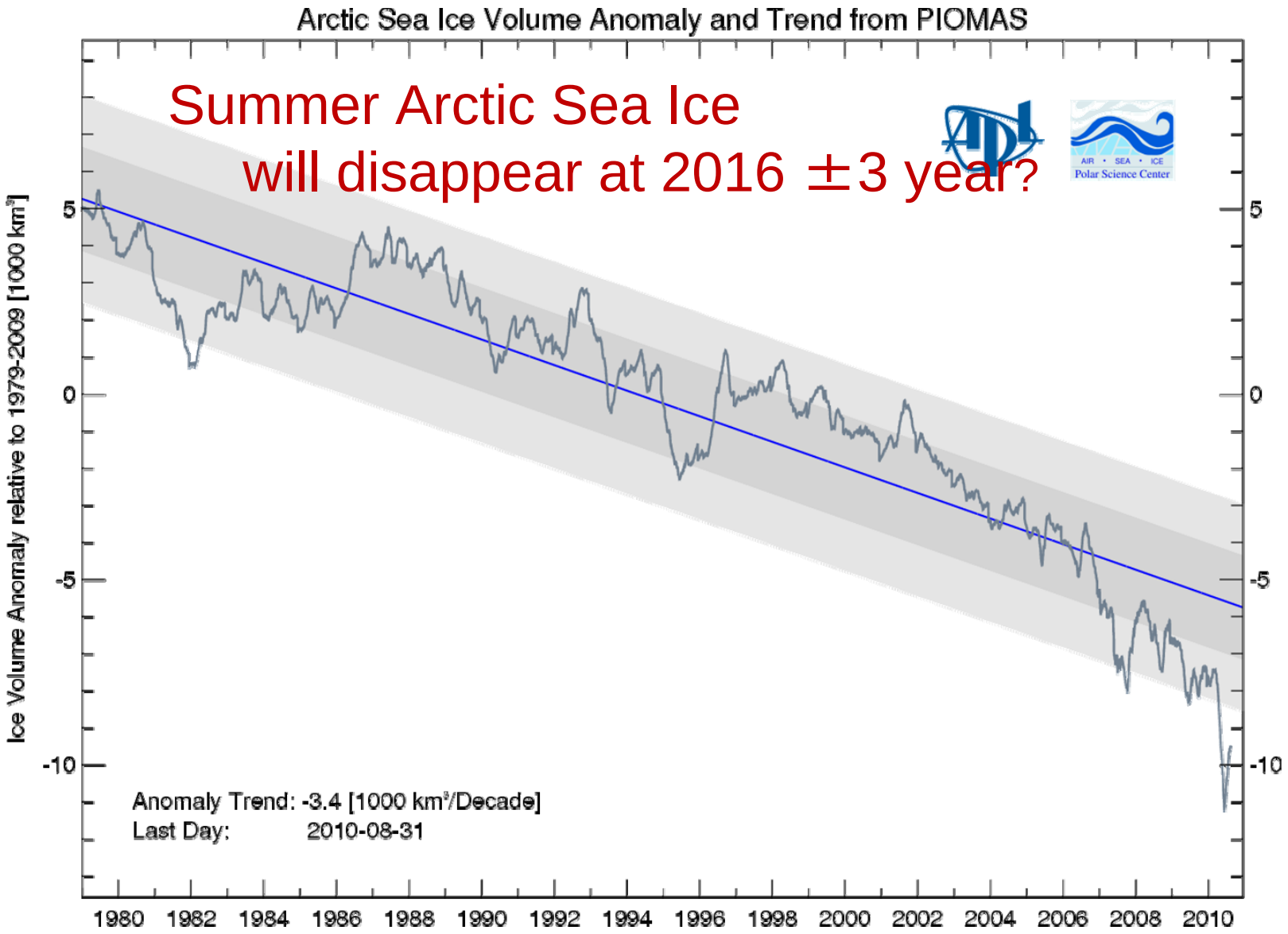
Geophysical Research Letters 34, L09501(2007)



Arctic September sea ice extent from observations (red line) is lower than that estimated by 13 IPCC AR4 climate models ensemble mean (solid black line). The models underestimate the GHG response, the externally forced component may be larger.

Ice-free Arctis Sea in Summer may be within a few decades.

Arctic Sea Ice Volume Anomaly

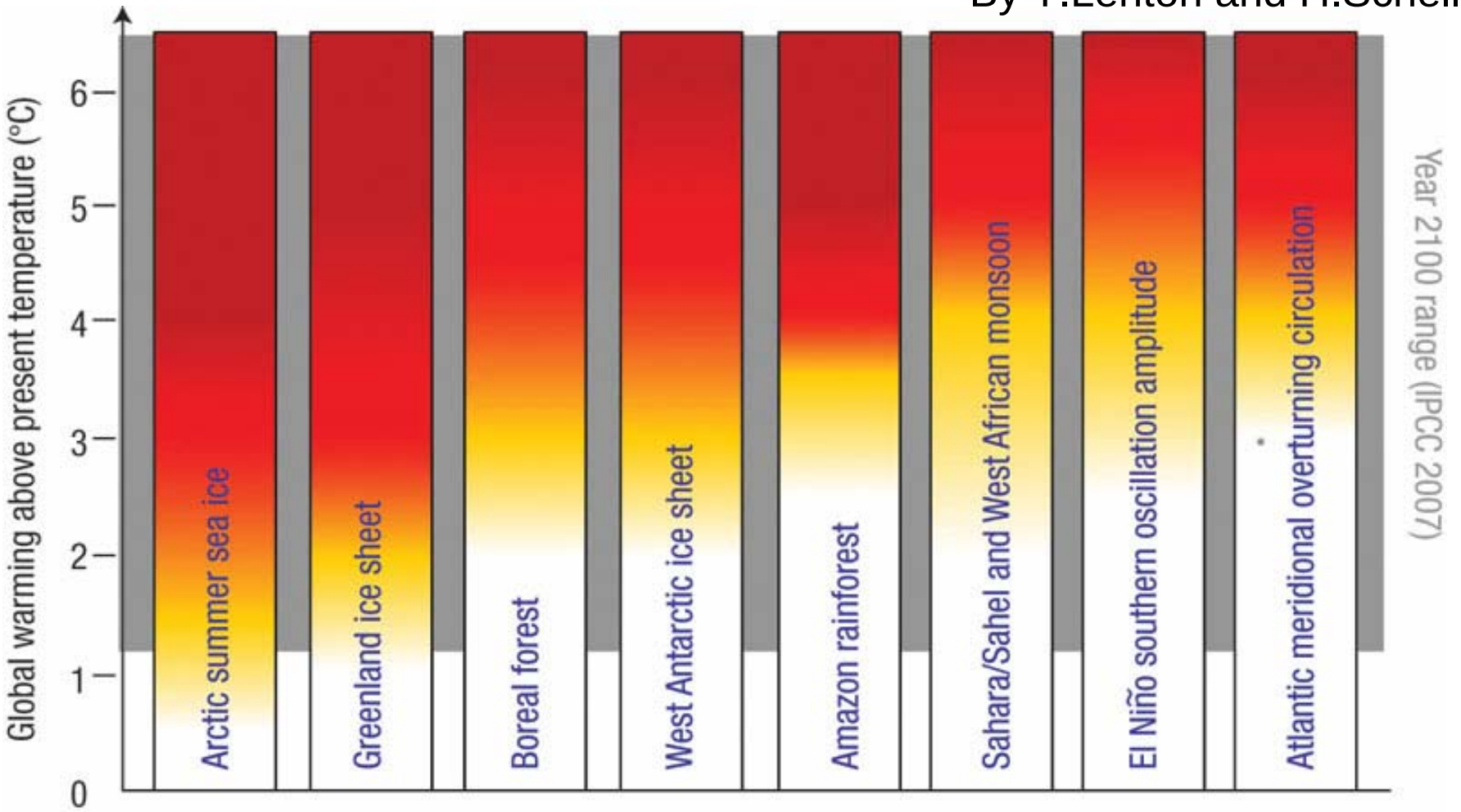


Continuously updated Arctic Sea Ice Volume Anomaly from PIOMAS. Daily Sea Ice volume anomalies for each day are computed relative to the 1979 to 2009 average for that day. The trend for the 1979- present period is shown in blue. Shaded areas show one and two standard deviations from the trend.

Source: Polar Science Center

Passing Tipping Points

By T.Lenton and H.Schellnhuber



Potential policy-relevant tipping elements that could be triggered by global warming this century, with shading indicating their uncertain thresholds.

L’aquila Summit, Italy, G8 and MEF

2009,July

「2℃ target」 was recognized clearly by political leaders.

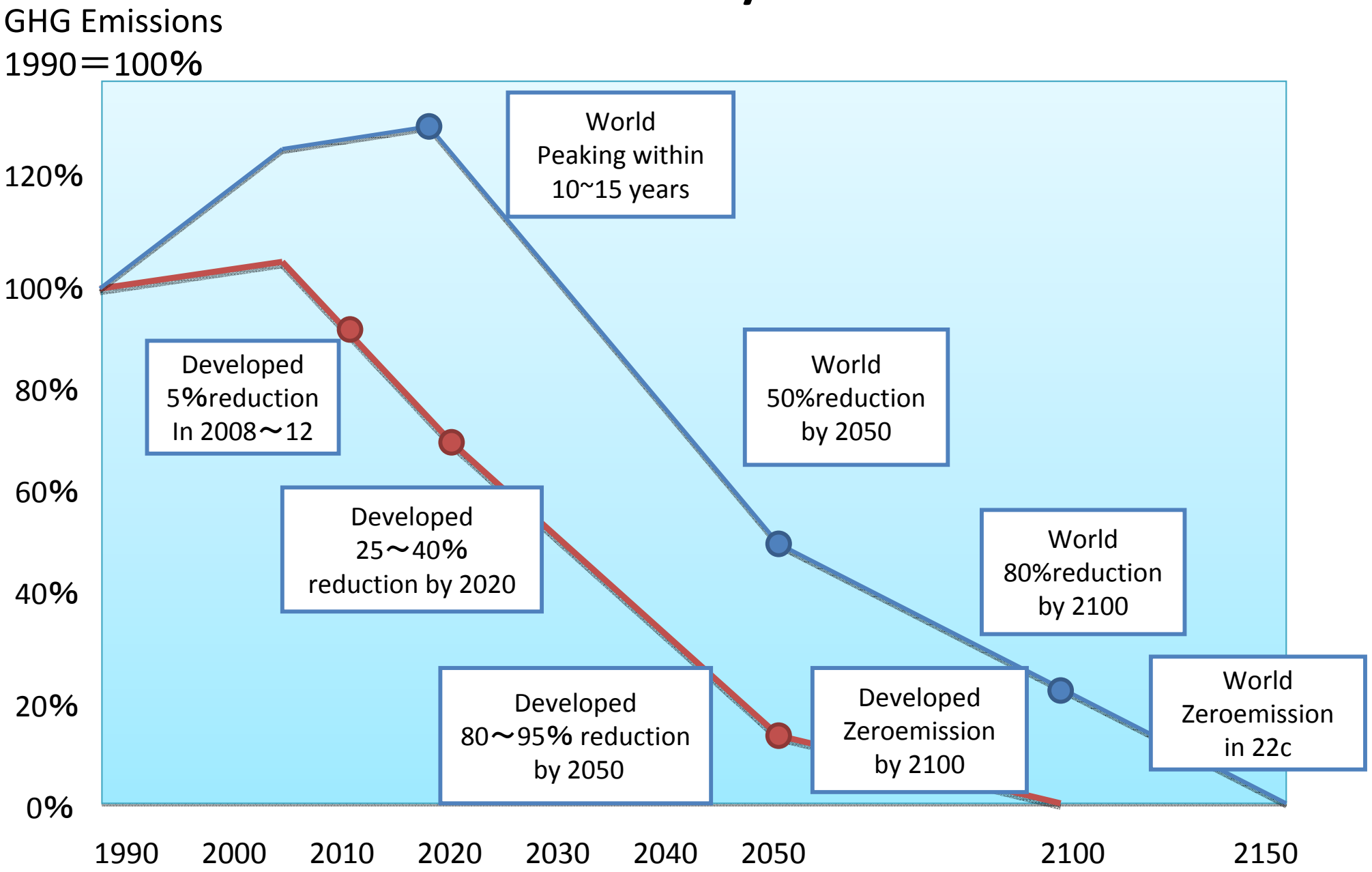
G8 L'Aquila Declaration 2009

"We recognize the broad scientific view that the increase in global average temperature above pre industrial level ought not to exceeds 2℃.
Because this global challenge can only be met by a global response, we reiterate our willingness to share with all countries the goal of achieving at least a 50% reduction of global emissions by 2050,recognising that this implies that global emissions need to peak as soon as possible and decline there after. As part of this, We also support a goal of developed countries reducing emissions of green house gases in aggregate by 80% or more by 2050 compared to 1990 or more recent years"

Japan's Ex Primeminister,Mr.Yukio HATOYAMA declaired "25% reduction of Green House Gas Emission by 2020"

September 7,2009

Zero-carbon Economy is our final Goal.



Emission Pathway needed to keep 2℃ target

- **Cumulative Allowable CO_2 Emissions (2010-2050) to keep the 2℃ target with the probability 67% is 750 billion ton**
- **Per capita budget of emission = 750 billion ton/6.8 billion = 110 ton**
- **Budget lifetime estimated by assuming the per capita CO_2 emission at 2008 for each country**

Country	Years
China	24
USA	6
India	88
Germany	10
Japan	11
Russia	9

ref. WBGU(2009)

To save the millions of biospecies,

(1)the surface temperature increase should be suppress
less than 1.5℃.

and

(2)the warming rate should be suppressed
less than 0.05℃/decade.

Actually, the warming rate is now 0.48℃/decade
in the arctic region.

IEA Strategy for 2℃/450ppm by 2030

ref. World Energy Outlook(2007)

Necessary Reduction of GHG

(1)**Energy Saving**(40%) 2%/year

(2)**Carbon Capture and Storage**(21%) establish 460 CCS

(3)**Nuclear Power Plant** (16%) Construct 235 plants

(4)**Renewable Energy** (19%)

Hydro	increase factor	2
Biomass	〃	10
Wind	〃	20
Geothermal	〃	4
solar	〃	130

(5)Biofuel etc

China

WBGU (1)

Impacts of climate change on the biosphere and human society

ref. “Climate Change as a Security Risk”
by German Advisory Council on Global Change (WBGU)

(1) Rise in mean temperature (IPCC, A1B scenario) for the year 2100

2.3～4.9℃ in eastern China

2.8～5.1℃ for the Tibetan highlands

(2) Increase in annual precipitation level

2～20% in eastern China

Heavy rain events will occur more frequently, as will heat waves and periods of drought; precipitation variability will thus increase markedly.

(3) The area covered by glaciers in the Tibetan highlands could decline by more than 60%. Combined with significantly earlier snowmelt, this would lead to a considerable seasonal reduction of runoff.

There are already 200 million people in China who have no access to clean drinking water.

It is assumed that by 2015, it will be possible to meet only around 85% of the water needs of the rural population.

WBGU(2)

(4) The coast of China is threatened by Sea-level rise.
A rise of 30cm could inundate 8,000 km^2 of the densely populated and highly industrialized Chinese coastal region.

(5) Almost a third of China's land area (27.3%) is already affected by desertification, particularly in inner Mongolia and around Beijing and this tendency is increasing.

(6) A rise of 2℃ in the global mean temperature could lead to a 5-12% reduction in the rain-fed rice yield in China as a whole.

(7) The loss of arable land, the decline in soil quality and pollution of air and water are already giving rise to costs amounting to around 8% of GDP (2004).
Every year millions of people fall victim to natural disasters; many of these are dependent on state aid.

(8) The rural population will bear the brunt of climate impacts. Compounded by ethnic, poverty and social disadvantage, these regional developments could have a destabilizing effect on the entire country and on neighboring states.

(9) Further significant risk and conflict potential arises from the concentration of the east coast.
The rising sea level and an increase in flood disasters, possibly also driven by more powerful typhoons, could cause major damage both to industrial facilities and to residential areas.

(10) The Chinese leadership runs the risk of being overstretched by the combined effects of heightened environmental problems, social polarization and economic and political liberalization.

Campbell(1)

The Age of Consequences: The Foreign Policy and National Security Implications of Global Climate Change

by Kurt M. Campbell et al (2007)

"Climate Wars"

"Year after year the worries and fretters would come to me with awful predictions of the outbreak of war. I denied it each time. I was only wrong twice."

by Senion British Intelligence official, retiring in 1950 after 47 years of service

※ China is now building traditional coal-fired power plants at a rate of almost one per week, each of which releases approximately 15,000 tons of CO_2 per day.

※ The size of China's vehicle fleet is projected to grow from 37 million to as many as 370 million during the next 25 years.

※ National wheat, corn, and rice yield could decrease by as much as 37% in the next few decades.

※ According to the world bank, 16 of the word's 20 most polluted cities are in China — the air is so polluted that it causes 400,000 premature deaths every year.

China's Role will be critical

※ China is becoming the primary driver of global climate change, now emitting more carbon dioxide in aggregate than any other nation.
China and the United States is establishing an "alliance of denial" in which the two countries are using each others inaction as an excuse to do nothing.

※ The United States must come to terms with climate change.

Greenhouse gases in the atmosphere at record levels
WMO, Nov.24, 2010

			compared to 1750
2009	CO_2 concentration	386.8 ppm	38% increase
	CH_4	1,803ppb	158% increase
	N_2O	322.5 ppb	19% increase

China emits one quarter of world carbon emissions and climbing by Reuters

CO2 emission in 2005	5.2 billion tones
CO2 emission in 2020	9.6～10.1 billion tones

(predicted by Chinese Academy of Science)

Even with such a big efficiency gain, 40 – 45% reduction of carbon Intensity by 2020 compared to 2005

The Environmental Performance Index (EPI) for Asia and Pacific (2006)		
Ranking	country	EPI
1	New Zealand	88.0
2	Malaysia	83.3
3	Japan	81.9
6	Korea	75.2
19	China	56.2
30	India	47.7

The CO_2 emission and Human Development Index (HDI) (2005)				
Ranking	Country	CO_2 emission(MT)	% of the world emission	HDI
1	USA	6045.8	20.86	0.951
2	China	5007.1	17.28	0.777
3	Russia	1524.1	5.26	0.802
4	India	1342.1	4.63	0.619
5	Japan	1257.2	4.34	0.953
6	Germany	808.3	2.79	0.935

China is a Black hole for resource.

Economic Development and Material Production of China		
	1995	**2005**
Population (Million)	1,211	1,308
GDP (Billion Yuan)	6,029	18,308
Steel (Mt)	95	353
Cement (Mt)	476	1,069
Paper·Pulp (Mt)	28.1	62.1
Electric Power Generation (1000 MKW)	1,007	2,500
Coal (Mt)	1,361	2,205
Oil (Mt)	150	181
SO_2 emission (Mt)	14.1	21.7

Present Status of Environmental Problems in China

Ref. 大転換期の中国環境戦略, 大野木昇司 他

(1) Water pollution

- Polluted water 20.8%, industrial and agricultural usable 24.2%, drinkable water 55%

(2) Water shortage

- Northern part, water resource is 392m³ per capita
- Southern part, water resource is 2,085m³ per capita
- World Bank's definition of water shortage 1,000～2,000m³ per capita

(3) Air pollution in 519 cities (2008)

- The first class standard 4.0%
- The second class standard 72.8%

(4) Soil pollution

- Polluted cropland ～10 million ha
- 2.4% of foods are polluted.

(5) CO_2 emission (energy – related)

- 6,028 billion ton (2007) World Ranking is No.1
- 2,2 billion ton (1990)
- 7,1 billion ton (2030) by IEA prediction
- Reduction target = CO2/GDP　40~45% by 2020 compared to 2005

Good News to the World.

2006～2010 (Five years plan)

(1) Forest cover ratio	20.36% at the end of 2008
(2) SO_2, COD	10% reduction by 2010 can be achieved
(3) Energy Saving	15.6% reduction by June 2009 20% reduction by 2010 can be achieved


The green race is on
The new business agenda
Scorecards on best and worst policies for a green new deal
MEASURING THE GREEN ECONOMY
Pursuing Green Growth in Asia and the Pacific
Vision 2050
ECO WORLD 2010
Green Growth at a Glance
The Way Forward for Asia and the Pacific

Principles of Ecodesign

Material

①Long –life
②Resource Saving
③Recyclable
④Recycled
⑤Non-Toxic
⑥Produced from Renewable Resources
⑦Cleaning Environment
⑧Improving Energy・Efficiency
⑨Produced by Low-Environmental Impact Processing
⑩Producing Alternative-Energy

Product

⑪Easy Disassembly

⑫Reuse of Parts(Remanufacturing)

Building

⑬Use of Alternative Energy

⑭Energy Saving

City

⑮Recycling System of Resources

⑯Sustainable Water Management

⑰Sustainable Transport System

⑱Sustainable Foods Management

⑲Sustainable Culture and Entertainment

⑳Sustainable Consumption

・Eco service(green-IT and Servisizing)

Four Types of Ecodesign Innovation

by H.Brezet

Type 1 Product Improvement （～Factor 2)

organization of a take-back system
changing raw materials
changing the type of coolant used etc.

Type 2 Product Redesign （～Factor 5)

increased use of non-toxic materials
increased recycling and easy disassembly etc.

Type 3 Product Concept Innovation （～Factor 10)

a change from paper-based information
exchange to e-mail etc.

Type 4 System Innovation（～Factor 20)

a change over in agriculture to industry-based
food production etc.

The Requirements for Green Business Platforms

(1)Exhibit eco・products and eco・services
(2)Publish directory of eco/products and eco・services
(3)Define eco・products and eco・services and systematically explain eco・labeling
(4)Provide Green Purchasing Guidelines
(5)Offer a series of seminars to SME's on Environmental Management System and Eco-innovation
(6)Match green businesses(B to B)
(7)Finance green ventures
(8)Certify environmental management and quality
(9)Educate and provide training for Green Purchasing

Environment-Innovation-Employment

Working paper to the informal Meeting of Environmental Ministers in Essen,Garmany,1-3 June,2007

World market volume of environmental technologies 2005[bn EUR]

Power generation	100
Energy efficiency	450
Material efficiency and nat. resources	40
Sustainable water management	190
Sustainable mobility	180
Waste management and recycling	30

[Biotechnology 30
Nanotechnology 100]

～1,000 (2005)

～1,300 (2010)

～2,200 (2020) annual growth rate 5.4%

illustrative estimates of the global order of magnitude of potential additional Sustainability related business opportunities in key sectors in 2050

Sectors	**Annual value in 2050 (US$ trillion at constant 2008 prices : mid-points with ranges shown in brackets**	**% of projected world GDP in 2050**
Energy	2.0(1.0～3.0)	1.0(0.5～1.5)
Forestry	0.2(0.1～0.3)	0.1(0.05～0.15)
Agriculture and food	1.2(0.6～1.8)	0.6(0.3～0.9)
Water	0.2(0.1～0.3)	0.1(0.05～0.15)
Metals	0.5(0.2～0.7)	0.2(0.1～0.3)
Total:Natural resources	**4.1(2.1～6.3)**	**2.0(1.0～3.0)**
Health and education	2.1(0.8～3.5)	1.0(0.5～1.5)
Total	**6.2(2.9～9.8)**	**3.0(1.5～4.5)**


日本最大級の環境展示会
エコプロダクツ2009
問い直せ、日本の力


Panasonic
SANYO
eneloop bike
乗る人に「快適」を、乗る「喜び」を。
Fun to Ride
Think GAIA
For Life and the Earth
SANYO
green energy store
東京ビッグサイト店
東京ビッグサイト店


問い直せ、日本の力
ソーシャルパワー元年
日本最大級の環境展示会
エコプロダクツ2009


伊藤園
pal*system
100万人の
食づくり運動
選ぶところからはじめる
エコ・アクション
新しいくらし提案
LION
UCC
Good Coffee Smile
タテヤマアドバンス株式会社


東芝は、
エネルギーの安定供給と
地球温暖化防止に貢献します。
eco
REGZA

APO

Eco-products International Fairs

Year	2004	2005	2006	2008	2009
Venue	Malaysia Mid Valley Exhibition Center, KL	Thailand IMPACT, Bangkok	Singapore Suntec Singapore international Convention & Exhibition Center	Vietnam National Convention Center, Hanoi	Philippines SMX Convention Center,Manila
Organizers	APO, Federation of Malaysian Manufacturers (FMM), and National Productivity Corporation, Malaysia (NPC)	APO, Federation of Thai Industries, and Thailand Productivity Institute (FTPI)	APO, Waste Management and Recycling Association of Singapore (WMRAS), and SPRING Singapore	APO, Vietnam Association for Conservation of Nature and Environment (VACNE), and VPC	APO, Philippine Business for the Environment (PBE), and DAP, Philippines
Theme	Living in harmony with the environment: Towards sustainable production & consumption	New environmental challenges for the global community	A better environment for all	For sustainable development and better life	Sustainable, Production, Sustainable Consumption, Sustainable Future
Date	2 – 4 Sept.	6 – 9 Oct.	31 Oct. – 2 Nov.	1 – 4 Mar.	19 – 22 Mar.
Number of Exhibitors	76	59	107	91	128
Area of Exhibition	3,600 sqm	5,000 sqm	7,300 sqm	10,000 sqm	5,500 sqm
Number of Visitors	12,000	23,000	35,000	98,000	83,000

EPIF2004 in Malaysia

Eco-products International Fairs

GPAC Chairperson Mr. Yoichi

Booth of Exhibitor

Opening Ceremony

Prof. Yamamoto handed over the Eco-products Directory to Minister of International Trade and Industry

EPIF2009 in the Philippines

Eco-products International Fairs

Opening Ceremony

President VIP Tour

Booth of Exhibitors

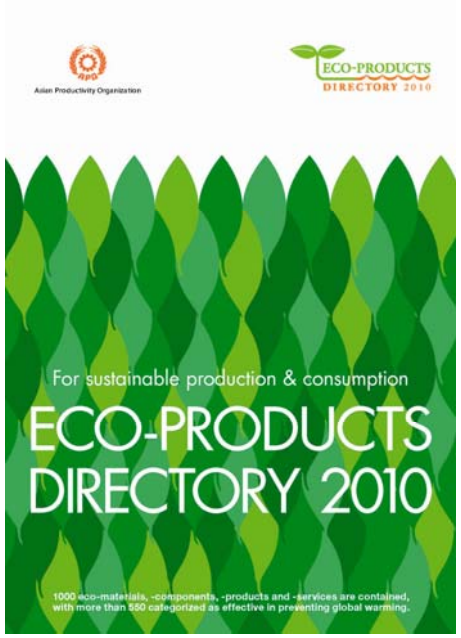
Handing Over Ceremony from EPIF2009 to EPIF2010


EXHIBITION HALL A B
CENDRAWASIH ROOM
ASSEMBLY HALL
PLENARY HALL
TOSHIBA
Panasonic
ideas for life
Panasonic
'eco ideas' globe

Eco-products Directory 2004-2010

Eco-Products Directory

- **Published annually since 2004 by APO**
- **Purposes: To promote the concept and practice of environmentally responsible purchasing among businesses and consumers in the region.**
- **Products covered: Eco products, eco services, eco components, eco materials totaling 1,000 items in 2010 version**
- **Criteria: if the items have been received, declared or registered with:**
  - **ISO environmental labels (type I, type II and/or type III)**
  - **environmental labels by consumer electronics industry and automotive industry**
  - **GPN Japan's database 'Eco Products Net"**
- **Produced by Eco Product Working Group and financed by APO**



Properties of listed products and services

- **Among more than 1,000 data entries submitted, the 2010 Directory contains 1,000 eco-products and –services.**

	2004	2005	2006	2008	2009	2010
Eco-materials	199	80	71	70	73	103
Eco-components	134	39	39	73	83	118
Eco-products	421	432	453	526	604	688
Eco-services		16	28	56	44	91
Total	754	567	591	725	804	1,000

- **More than 550 are categorized as effective in preventing global warming in 2010.**

	2004	2005	2006	2008	2009	2010
Global warming prevention	263	274	289	429	441	566

Eco-products

EP-1-024 — **Home electric appliances / Lightings**

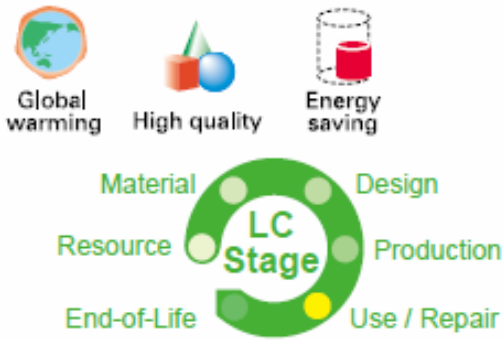
electric washing machines

Full Auto Washer Dryer with Heat Pump System

<Heat pump dry system>
The latest heat pump technology achieves one third of power consumption (electrisity cost), a half of water consumption, and a half of time while washing and drying 6kg of load in comparison with the previous model;NA-V81. 65C-degree dehumidified air dries even delicate cloths gently.

<Innovative 'Dancing wash technology'>
In addition to the traditional tumble washing, the brand new 'Dancing wash technology' makes your clothes very clean. This new function reverses the rotation quickly to squeeze the dirt out from cloths.

<'Mist refresh' function>
The mist generated by supersonic wave moistens the clothes to remove odor and to stretch the wrinkles. The mist is so fine that the water molecule can penetrate deeply into the fiber. The laundry will be refreshed after drying.



Full Auto Washer Dryer : NA-VR2200

Matsushita Electric Industrial Co., Ltd.

1-2 Kamisu-cho, Toyonaka, Osaka 561-0823, Japan
Tel 81-6-6331-6826 Fax 81-6-6334-0567
E-mail
URL

Available in : Japan

Eco-products

EP-1-121 — **Home electric appliances / Lightings**

electric refrigerators

Energy saving refrigerator for families with excessive cooling technology

A refrigerator for families using excessive cooling technology. It refrigerates food deliciously as it prevents the destruction of the cell.

----------<< M : Material >>----------

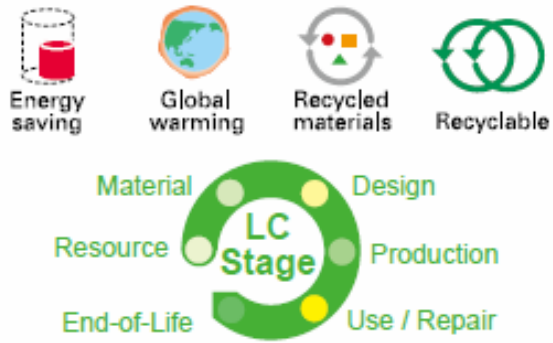
It uses recycled plastic for a board case or a caster. It is made easy to be recycled by the materials indication of the resin part.

---------<< E : Energy >>--------

For consumption electricity 620kWh/year of the product (ME-G50M) one year ago, MR-G52N the capacity of it is increasing realizes 530kWh/year. It turned the compressor smoothly by the new control (named " the new smooth wave inverter ") and prevented outbreak of useless torque which improves energy saving and silence.

---------<< T : Toxicity >>----------

It uses non-Freon refrigerant isobutane R600a that global warming potential is extremely low.



MR-G57N-W

Mitsubishi Electric Corporation

2-7-3, Marunouchi Chiyoda-ku, Tokyo 100-8310, Japan
Tel 81-3-3218-9024 Fax 81-3-3218-2465
E-mail eqd.eco@pj.MitsubishiElectric.co.jp
URL http://www.mitsubishielectric.co.jp/

Available in : Japan

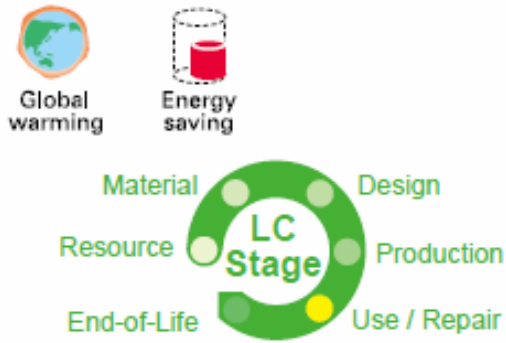
Eco-products

EP-2-003 **Carriers / Automobiles**

automobiles

New eco-friendly Prius with hybrid power

The new Prius model is equipped with THS, a new-generation Toyota Hybrid System known as Hybrid Synergy Drive, which means simultaneous evolution of ecology and power. It achieves world-beating fuel consumption of 35.5km/L and low emissions. The drive has been dramatically improved by the development of hybrid power. 10-15 mode drive.
(Ministry of land, Infrastructure and Transport figure)



Prius

Toyota Motor Corporation

1, Toyota-cho, Toyota-shi, Aichi 471-8571, Japan
Tel 81-565-23-1341 Fax 81-565-23-5754
E-mail satoshi_aida@mail.toyota.co.jp
URL http://www.toyota.co.jp

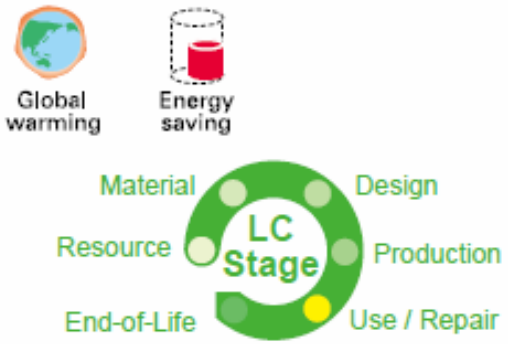
Eco-products

EP-6-015 **Interior decoration / Exterior decoration or furniture**

sanitary pottery, accessories

NEOREST AH type : A toilet saving electricity and water

This toilet is equipped with "Hybrid Ecology system", which is a cleaning system of water flow from direct water pipes and new pump developed for this product. This technology reduces a quantity of water for cleaning the toilet to 5.5 liters, resulting in significant saving water compared with 13 liters of existing products. In addition, "Wonder Wave Cleaning" function, technology of washing a hip, repeats strong and weak spouting more than 70 times a minute, reducing a quantity of water nearly half compared with existing products with feeling fully washed. Also, this toilet achieved saving electricity. The timer saving power function turns off a power of the seat heater at the every time users set. Additionally, the super automatic saving power function learns the use's life pattern, and turns down the surface temperature of the seat and turns off the power of the seat heater automatically at the time user almost never use, achieving farther saving electricity.



NEOREST AH type CES9793Y

TOTO LTD.

2-24-2, Sakurashinmachi, Setagaya-Ku, Tokyo 154-8540, Japan
Tel 81-3-5451-1110 Fax 81-3-5451-1049
E-mail
URL http://www.toto.co.jp

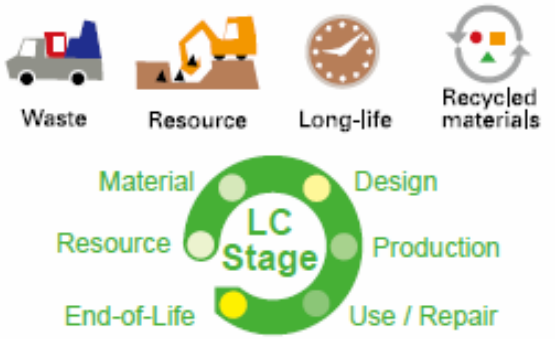
Eco-products

EP-6-026 **Interior decoration / Exterior decoration or furniture**

ceramic tableware

Recycling Ceramics "Rebirth of tableware - Re-shokki"

- The product is the ceramic tableware “RE-shokki” which used circulating-type resources for the first time in Japan. It is yielded by the recycling technology and the regeneration system at the place of manufacture, and by the network between the users in land. The green life 21 project was set up by the collaboration of 32 companies.
- The product in the photograph contains 20% of regeneration material, namely the crushed product of the spent tableware. The bending strength is 131MPa, which is 1.6 times large compared to that of the conventional tableware. The product has safety and practicability in the point of the water-absorbing capacity and the thermal shock resistance. The CO_2 discharge at the production is 2450kg/t, which is 3% less than that of the conventional tableware. The reduction effect is larger, as the blend ratio of the regeneration material is higher.
- We intend to contribute to the environment efficiency through the ceramic circulation system. It includes the simplification of manufacturing process, the restraint coloring agent, the loading efficiency at the distribution, the design considering life and washability, the repair service, etc.



Recycled-Tableware "GL21-Oliva"

Gifu Prefectural Ceramics Research Institute

3-11 Hoshigadai, Tajimi City, Gifu Pref. 507-0811, Japan
Tel 81-572-22-5381 Fax 81-572-25-1163
E-mail hasegawa-yoshikazu@pref.gifu.lg.jp
URL http://www.gl21.org/

Available in : Japan,France and other countries

Eco-products

EP-6-039 **Interior decoration / Exterior decoration or furniture**

heat pump hot-water supply system

Eco-friendly water heater for residential use

Eco Cute is a household water heater that offers dramatic energy savings on the use of hot water, which normally accounts for about a third of a household's entire energy consumption. It generates hot water using atmospheric heat by means of a heat pump system and offers energy savings of around 30% compared with a conventional combustion type water heater together with a reduction in green house gas emission. The use of natural refrigerant CO_2 contributes to environmental conservation including the prevention of global warming.

CO_2 refrigerant heat pump water heater (Eco Cute)

Tokyo Electric Power Company

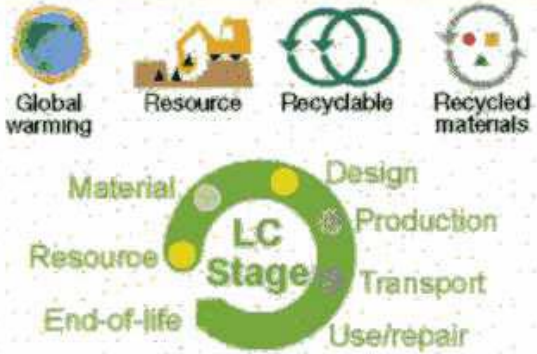
1-1-3 Uchisaiwai-cho Chiyoda-ku, Tokyo 100-8560, Japan
Tel 81-3-4216-1111 Fax 81-3-4216-3479
E-mail kawashima.toshiyuki@tepco.co.jp
URL http://www.tepco.co.jp/en/index-e.html

Available in : Japan,Europe

Highly functional and eco-friendly office chair "Spina"

Environmental performance

Spina chair has the following eco-friendly features.
Use of recycled materials: Parts made from 100% recycled polypropylene out of recovered battery cases are used for the mechanism cover, levers, etc.
Reduction of material use: The inner shell with numerous slits in the seat pan named "float bending seat" provides a cushion effect, reducing the amount of urethane compared with conventional products.
Material labeling: The materials used in most plastic parts are labeled to facilitate separation and recycling at the time of disposal.



Product performance

With the passive slide seat (PSS) system that makes the seat sink and slide back when seated, and the active lumber support (ALS) system that makes the lumber part of the chair's backrest push forward, Spina chair supports the user's back properly even when sitting back and leaning or sitting forward. Instead of the user having to adjust to the chair, the chair adjusts to the user. This human-friendly Slina chair won the Gold Prize of the Good Design Award in 2007.

Spina Chair

ITOKI CORPORATION

4-12, Imafukuhigashi 1-chome, Joto-ku, Osaka, 536-0002, Japan
Tel +81-6-6935-2200 Fax +81-6-6935-2268
URL http://www.itoki.jp/
URL http://www.itoki.jp/spina/
URL http://www.itoki.jp/udeco/communication/erreports.html

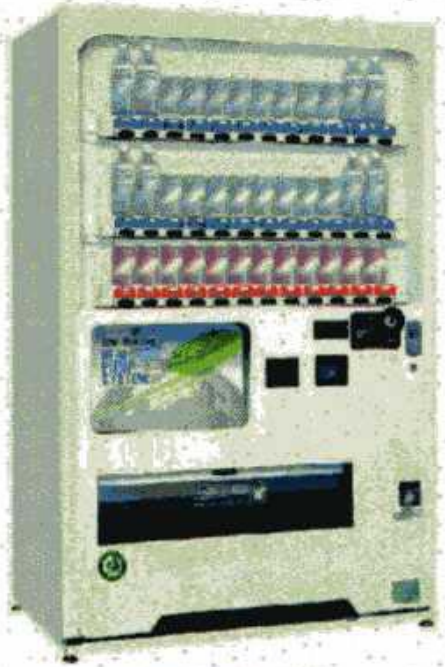
NonFron Vending Machine with Heat Pump System: NS-9P36HP

Environmental performance

A waste heat recovery heat-pump system of the NS-9P36HP is realized by placing the two external heat exchangers, one for cooling and the other for heating cycle, together in one unit. Equipped with this technology, the model provides more than twice effective heating operation than the FY 2005 model (NS-5R30) and achieves the year 2012 energy regulation by the Japanese government.

Product performance

The model contains a wide range of drinks and its easy-to-find color promotes sales.



NS-9P36HP

Panasonic Corporation, Home Appliances Company

3-4-74 Noji-higashi, Kusatsu City, Shiga, 525-0058, Japan
Tel +81-77-566-4805 Fax +81-77-566-4843
URL http://panasonic.net/csr/

Available in: Japan

Eco-products

EP-7-038 **Building and civil engineering**

residential house

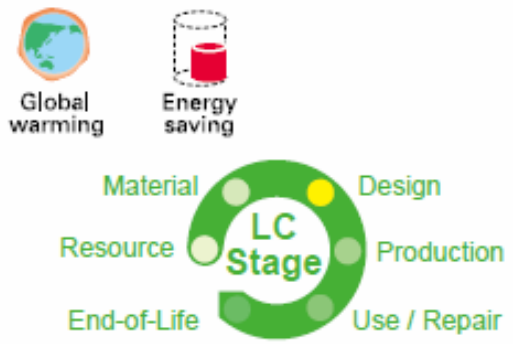
Zero-utility-cost Houses

Combination of the above mentioned technologies can realize zero utility cost. While utility cost/year at an ordinary residential house amounts to 226,000 yen, that at highly heat insulated house adopting highly effective hot water unit, all electrification and mounting the photovoltaic generation system of 5.5 kW capacity amounts to minus 1,000 yen.

Annual CO_2 emission as environmental value can be reduced to 580 kg from 3090 kg of an ordinary residential house.

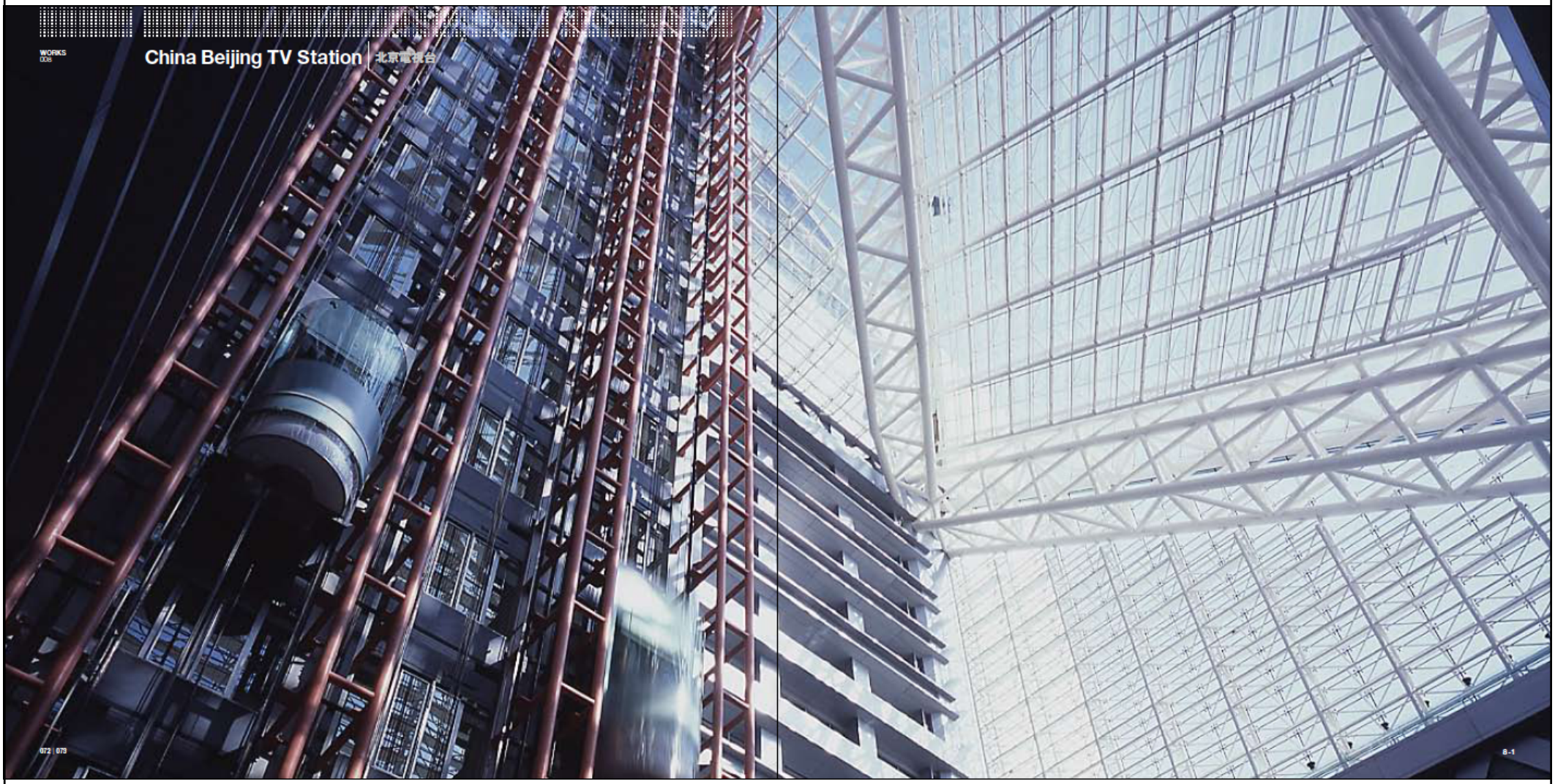
Evaluating by life cycle cost, the initial costs increase by approximately 2.6 million yen in total in order to equip the house with these systems, but considering the increased costs to be depreciated by the reduction of the utility charges, they can be repaid by approximately 13 years, which may be able to be proposed to possible users as economical advantages.

This house is becoming an important housing model, leading to the expansion of renewable energy and to the reduction of CO_2 emissions in Japan.



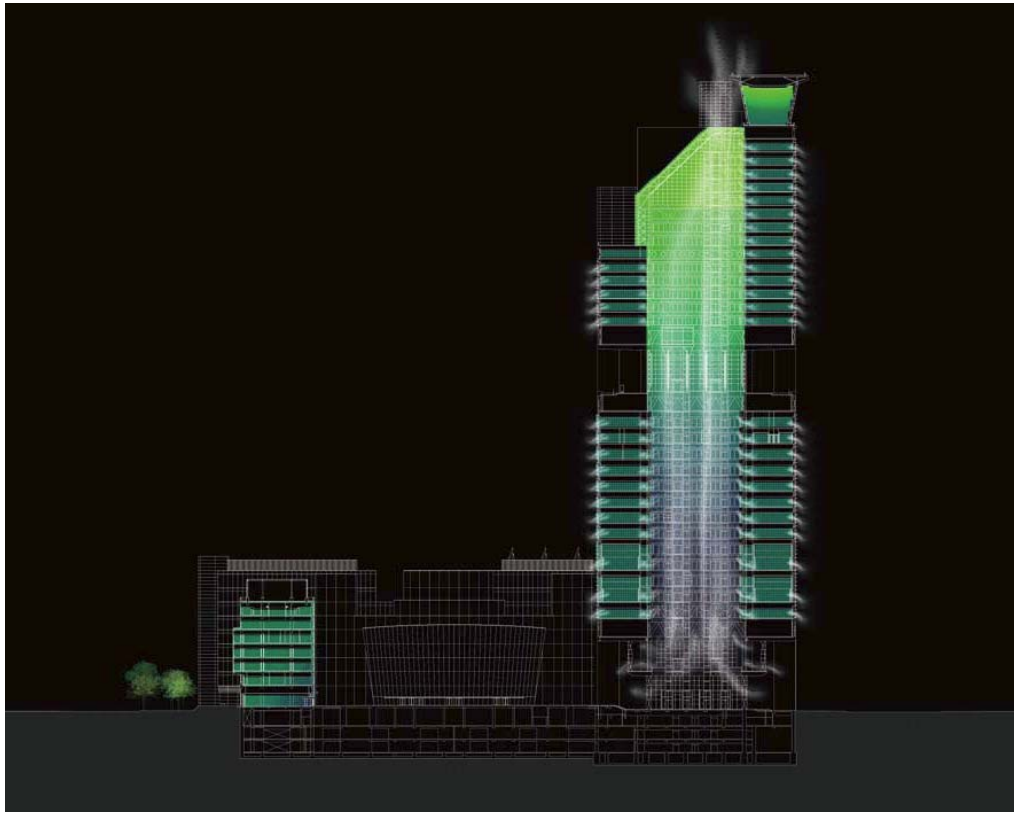
Sekisui Chemical Co., Ltd.

2-3-17, Toranomon, Minato-ku, Tokyo , Japan
Tel Fax
E-mail kankyo@sekisui.jp
URL http://www.sekisui.co.jp/



China Beijing TV Station (Green Building)
by NIKKEN SEKKEI

180m high atrium uses gravity ventilation to create natural airflows



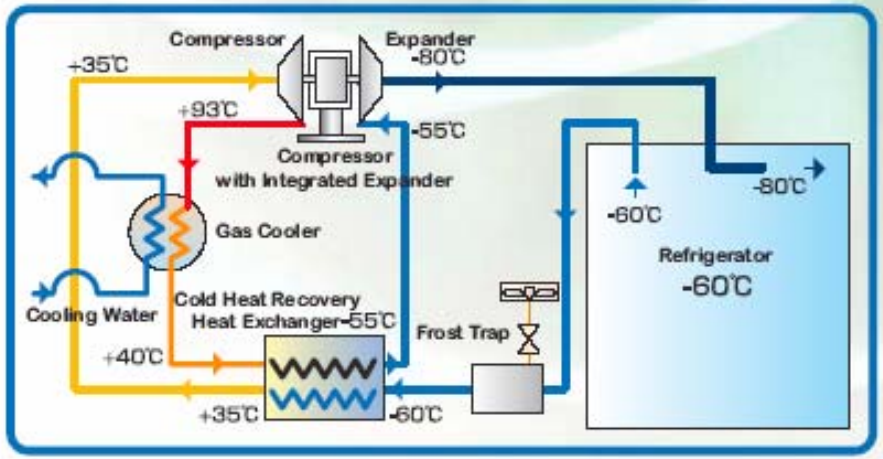
Beijing TV Station
by NIKKEN SEKKEI

8-3: View of building from northeast. The building's steel superstructure creates a three-dimensional stacking composition.
北東側外観。鉄骨のスーパーストラクチャーによって立体的に積層させた構成としている。

Installation in Japan

This system is expected
as a equipment that freezing
keeps -50～-100℃

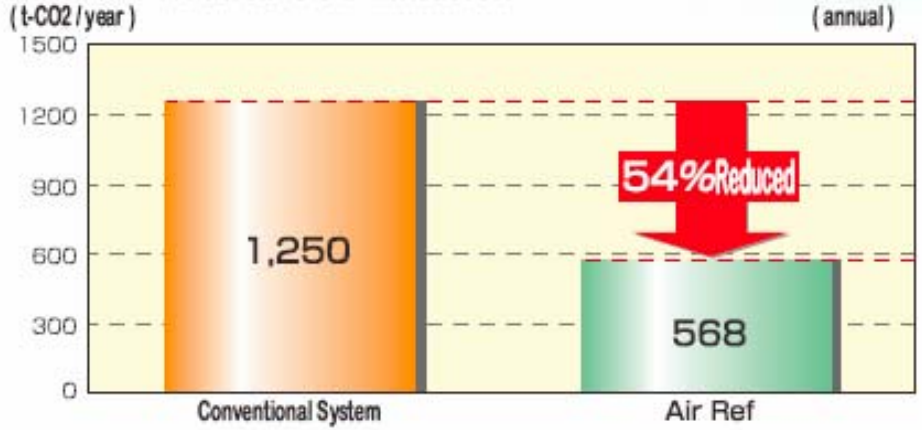
54% Reduction of CO2 Emission



Target: Ultra cold refrigerator for tunas and bonitos, rapid freezer, frost-破砕 etc.

- Using [Air] as the ultimate natural refrigerant, [Air Ref] is safe and eco-/people-friendly.
- Due to the turbo compressor with integrated expander, high COP can be achieved,saving energy by 50% comparing the conventional types.
- Due to its low operating pressure, exempt from legal regulations.
- Directly cooling the air, Air Ref does not require a fan coil unit or piping for refrigerant in the storage.
- Dihumidifying agent reduces frosting in the storage. Defrosting is not required.

Efforts to Reduce CO2 Emission



Case Study

2,000 ton Refrigerator
Interior Temperature : -60℃

Power Consumption

< Conventional System > R22 2 Stage Compression Refrigerator	〈Air Ref〉
281kW	128kW

Eco Products Directory as Strong Measure for Pursing Green Growth in Asia and the Pacific

"A new paradigm for Green Growth in Asia and the Pacific would require concept and system changes to achieve a dynamic and synergistic relationship between the environment and economy. The Green Growth paradigm also requires that, while conventional environmental policies focus on pollution control, policy options focusing on eco-efficiency aspects of environmental sustainability must be strengthened in the process of economic development. The Green Growth paradigm will therefore require that environmental policies be integrated with common economic policies to create a win-win synergy between the environment and the economy, and be focused more on ecological efficiency."

by Rae Kwon Chung and Euston Quah

Eco-Products Directory can be used for:

(1) Green public procurement

(2) Green business buyers

(3) Green consumers

(4) Environmental education purpose

(5) Producers to showcase their environmental technologies

Development of Environmental policy in China

① 科学的発展観　2003　Oct.
Scientific Development View

② 一票否決制度　2006　April
No promotion if a governmental official can not fulfill the target of environmental conservation

③ 生態文明　2007　Oct.
Ecological Civilization
Under Energy /Resource Saving and ecologic / environmental conservation, new industrial structure, development style and consumption model should be pursued.

④ 低炭素経済　2009　Aug.
Low-Carbon Economy

⑤ 政府のグリーン調達　2009
Green Public Procurement
約8000の製品カテゴリーについて140億元調達

政府绿色采购效果

Effect of Government Green Procurement

2006-2009

14 billion RMB (2009)

1. 直接效果 Direct Effect

通过政府绿色采购的实施，企业的环境意识进一步增强，改进了节能、环境技术，生产节能、环保产品的积极性也在不断提高，对发展节能环保产品的方向，对建设资源节约型、环境友好型社会发挥了重要作用。据不完全统计2008年绿色产品政府采购金额占同类产品的政府采购总额的比重已经达到了80％左右，环境标志产品生产企业的经济效益也得到了提高。

Through implementation of government Green Procurement , environmental awareness of enterprises has been further improved, energy-saving and environmental technology improved, positivity producing energy-saving and environment-friendly products increased, so Green Procurement plays an important role on the direction of developing energy-saving environment-friendly products, on building a resource-saving and environment-friendly society. According to incomplete statistics, in 2008, the government purchasing sum proportion of green products accounts for about 80% of total government purchasing sum of similar products, the economic efficiency of environmental label products enterprises has also been improved.

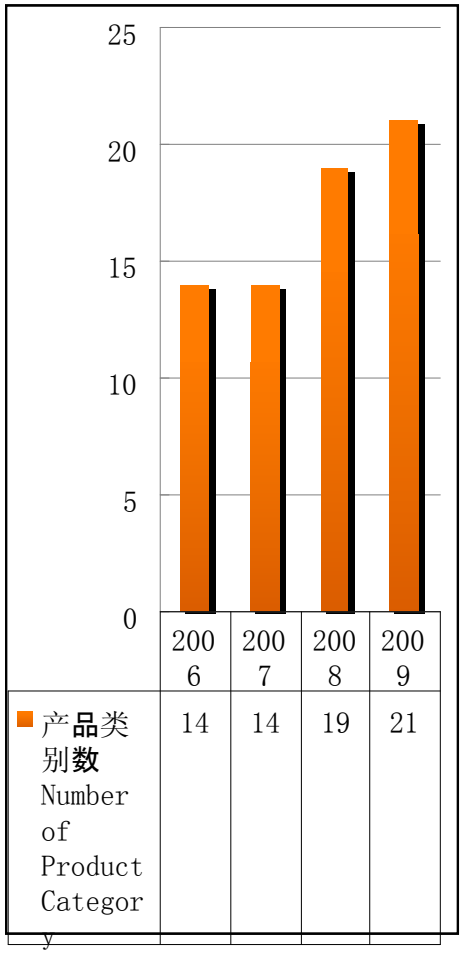
2. 间接效果 Indirect Effect

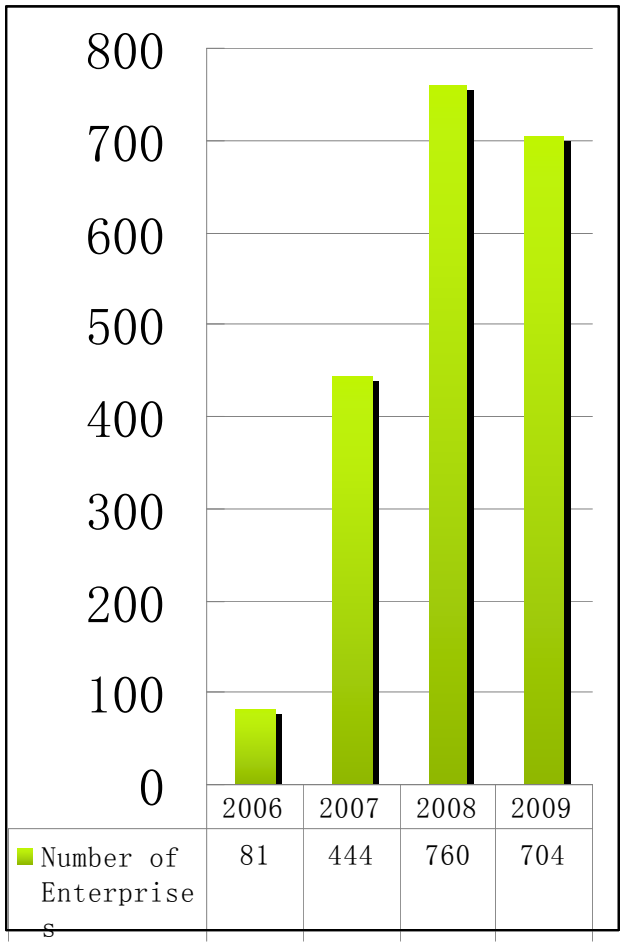
树立了政府环保形象，提高全社会的环保意识，推动企业环保技术进步，保护环境和人体健康，节约能源，促进资源循环利用，实现了经济社会可持续发展。

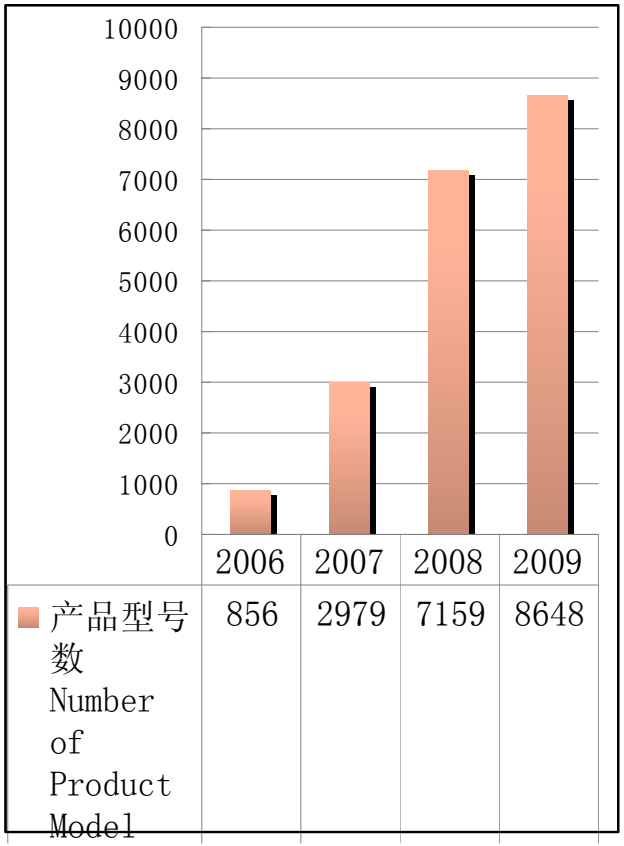
Established an environment-protecting governmental image, increased the environmental awareness of the whole society, promoted corporate environment-friendly technical progress, protected environment and human health, saved energy, promoted resource recycling, achieved economic and social sustainable development.

政府绿色采购清单回顾

Retrospection of Government Green Procurement List







第一批到第四批环境标志产品政府采购清单的种类，企业数和产品型号数

Category, enterprise number and product model number of environmental labeling products in No.1-No.4 government purchasing lists

中新天津生態城（Tianjin Eco-city）

Confucianism, Taoism, Buddhism in China

“範圍天地之化而不過，曲成萬物而不遺”—（周易）

“裁成天地之道，輔相天地之宜”—（周易）

“天行健，君子以自強不息；
地勢坤，君子以厚德載物”—(周易)

道法自然，無為而治—（老莊）

- 天人合一，师法自然
- 天人和谐，不以人灭天
- 以“天和”为美，以“止”为德

知足常樂

Summary

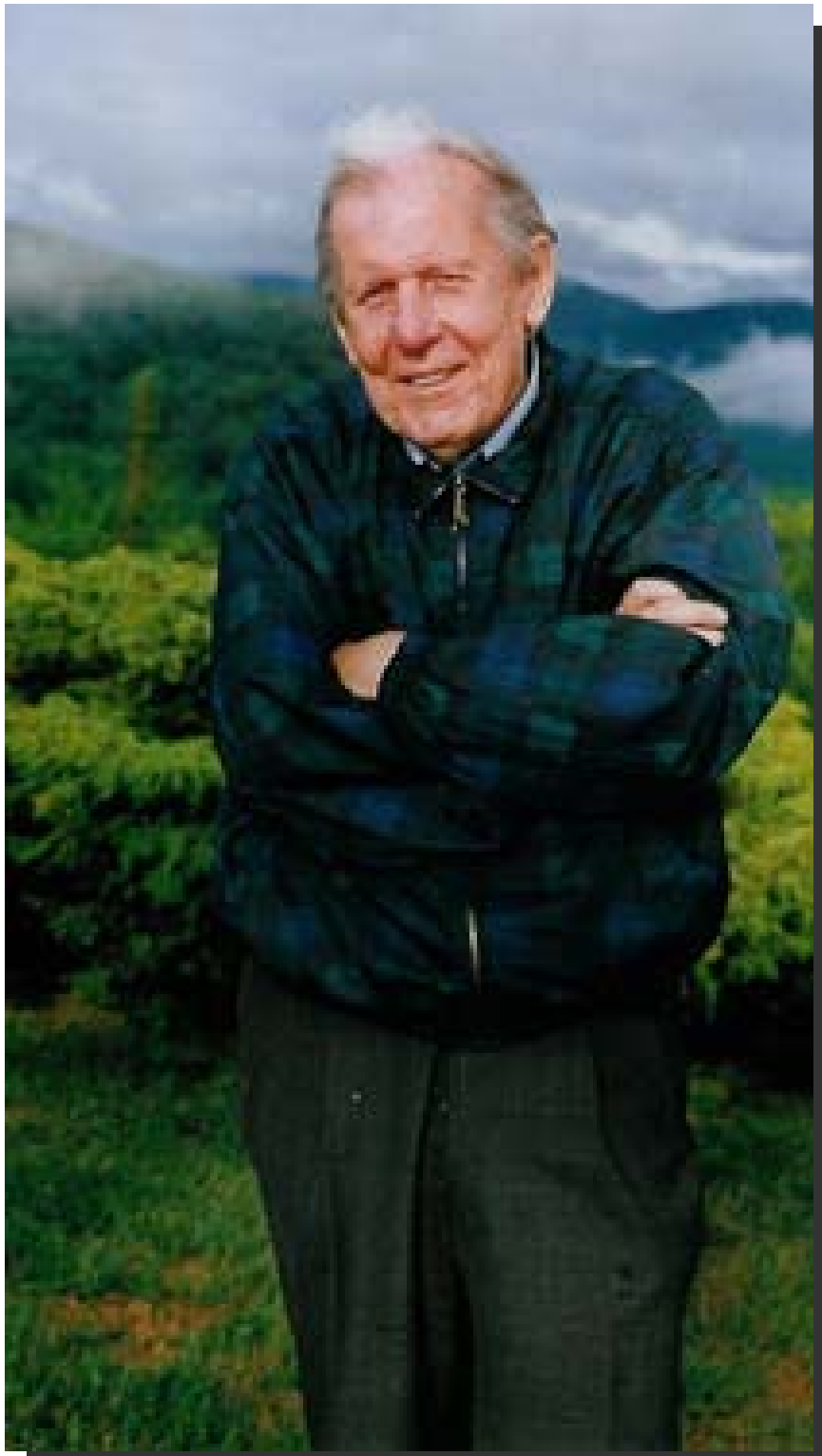
(1) In the business as usual case, Arctic Sea Ice will disappear in summer season within 10～30 years which accelerate global warming.
The surface temperature of the earth will exceed the 2℃ target within 20～30 years.
Human Beings will face serious climate emergency within 30 years.

(2) Due to the increase in the number of environmental refuges and other severe climate disasters climate wars may occur in some hotspots of climate change.

(3) For combating against dangerous climate change we should make a great transformation of human civilization from industrial to ecological one.

(4) China should play a crucial role in transforming the human civilization.

(5) Ecologically sustainable economic growth (green growth) can work tentatively, but in the long term we need a new unison or philosophy for ecological civilization.



Thomas Berry
(November 9, 1914—June 1, 2009)

"The universe is a communication of subjects, not a collection of objects."

The Great Work by Thomas Berry

"The Great Work now is to carry out the transition from a period of human devastation of the Earth to a period when humans would be present to the planet in a mutually beneficial manner."

"The Great Work before us is not a role that we have chosen. It is a role given to us, beyond any consultation with ourselves. We did not choose. We were chosen by some power beyond ourselves for this historical task."

"In the immense story of the universe, that so many of these dangerous moments have been navigated successfully is some indication that the universe is for us rather than against us. We need only summon these forces to our support in order to succeed."

Action for the Ecozonic To Be Taken in 2002 —Or at Least Get Started

by Herman Greene

Idea Six – Let's Harness the Power of Business and Technology

Idea Seven – Let's Become Actively Engaged in Green Politics,

Maybe through the Green Party and Maybe Not.

Idea Nine – Let's Develop a lifestyle Movement and Support

Each Other in journeys to the Ecozonic

Final Idea – Let's Work Together on Ways to Spread