



The 28th AIM International Workshop 13/09/2022

30 Years of AIM

- Backbone of Japanese Science-based Climate Policy

Shuzo Nishioka
IGES

Azumino in June

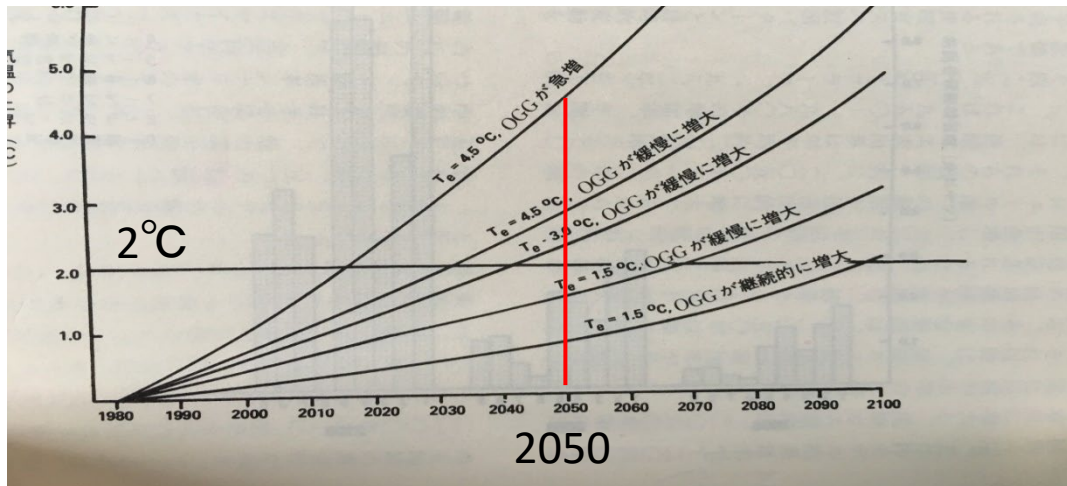
Can We Delay A Greenhouse Warming?

US EPA 1983

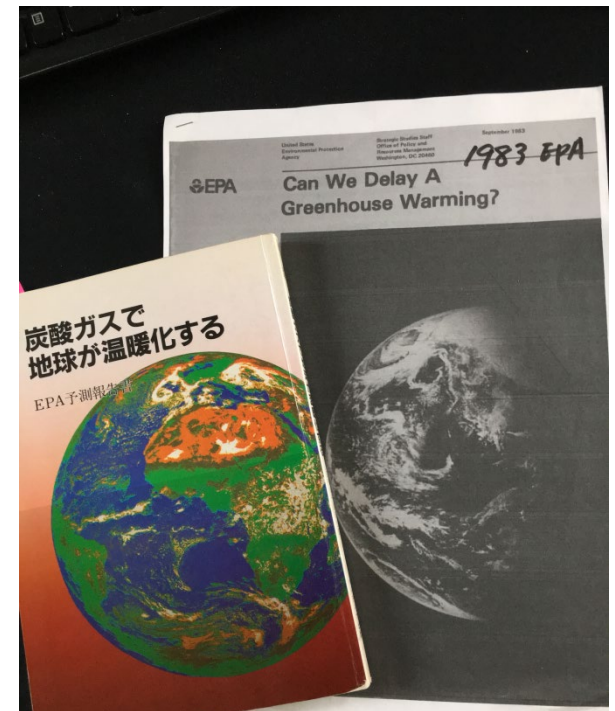
Implication of Findings

- Global greenhouse warming is neither trivial nor just a long-term problem
- Research should focus on **how atmospheric temperature responses to changes in GHG**
- **A 2 degree increase in temperature by (or perhaps well before) the middle of the next century leaves us only a few decades to plan and cope with a change** in habitability in many geographic regions.
- Changes by the end of 21st century could be catastrophic taken in the context of today's world.

Prediction of temperature rise responding to emissions



Based on IEA Edmonds & Reilly Model and EPA



1. Establishment of science-based policymaking methods

Framing climate policy and role of AIM:(1)

COSMO Plan: Comprehensive Strategies for Moderating Global Warming Plan (1989-92)

11 experts from wide discipline/sector discussed and concluded:

- **5 principles of Japanese action**

- (1) Fulfilment of own **Polluter-Pays Principle** responsibility
- (2) Contribution as an environmental nation with technology
- (3) International cooperation based on **equal footing position**
- (4) Leadership in environmental action internationally
- (5) Promotion of International agreement framework

- **Framework of climate policy & policy options**

- energy saving
- inducing innovation by early ambitious target setting
- co-benefit with pollution control • urban energy change
- sustainable forestry • agricultural productivity
- just technology transfer • simple life, economic instruments...

Framing climate policy and role of AIM COSMO Plan(2)

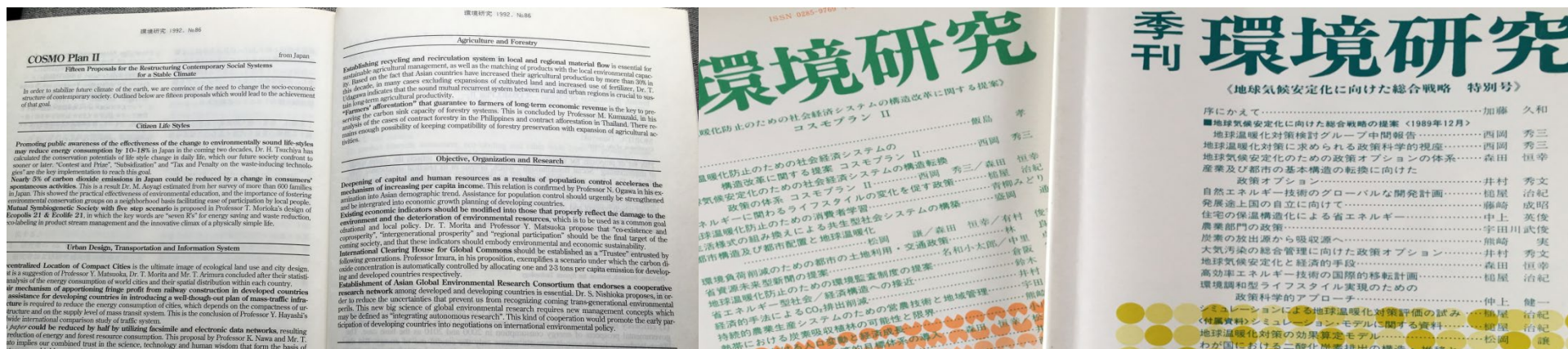
Creation of climate policy science community

Special characteristics of climate change, with its matters of value choice, pass dependency, more than optimization and inevitable risk concept, requires reasonably harmonized analysis and **policy formation with natural science, and policy scientific insight.**

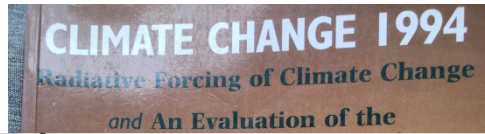
- (1) Establish **domestic policy science research community**
Research group for Japan-specific policy, networked by linkage model
Capacity development at universities
Financial and organizational research support systems
- (2) Establish **international network** of policy science community
Formation of **invisible research institute** for fermenting international agreement
- (3) Enhance **academic society** for policy science, economics, international relations and ethics for global environment

Framing climate policy and role of AIM COSMO Plan(3)

- These research results on comprehensive policy structure for CC, compiled into two volumes of journal, was submitted as a Japanese proposal 'Fifteen proposals for the Restructuring Contemporary Social Systems for Stable Climate' to UNCED (Earth Summit: 1992)
- The suggestion of inevitable socio-economic restructuring led climate policy of Japan thereafter, to a transition to 'Low Carbon Society', not a simple energy transition,
- And it suggested to the structure of AIM models and potential policy options as well.



Establishing of science based policy making methods: Development & deployment of AIM through IPCC



6

An Evaluation of the IPCC IS92 Emission Scenarios

J. ALCAMO, A. BOUWMAN, J. EDMONDS, A. GRÜBLER,
T. MORITA, A. SUGANDHY



2

Greenhouse Gas Emission Mitigation Scenarios and Implications

Climate Change 2001: Mitigation

Co-ordinating Lead Authors:
TSUNEYUKI MORITA (JAPAN), JOHN ROBINSON (CANADA)

Lead Authors:
Anthony Adegbulugbe (Nigeria), Joseph Alcamo (Germany), Deborah Herbert (Canada), Emilio Lebre La Rovere (Brazil), Nebojša Nakicenovic (Austria), Hugh Pitcher (USA), Paul Raskin (USA), Keywan Riahi (Iran), Alexei Sankovski (USA), Vassili Sokolov (Russian Federation), Bert de Vries (Netherlands), Dadi Zhou (China)

Contributing Authors:
Keim Jiang (China), Ton Manders (Netherlands), Yuzuru Matsuoka (Japan), Shunsuke Mori (Japan), Ashish Rana (India), R. Alexander Roehrl (Austria), Knut Einar Rosendahl (Norway), Kenji Yamaji (Japan)

Review Editors:
Michael Chadwick (UK), Jyoti Parikh (India)

Special Report Emissions Scenarios 2000

Nebojša Nakicenović, Joseph Alcamo, Gerald Davis, Bert de Vries, Stuart Gaffin, Kenneth Gregory, Arnulf Gröbler, Tae Yong Jung, Tom Kram, Emilio Lebre La Rovere, Laurie Michaelis, Shunsuke Mori, Tsuneyuki Morita, William Pepper, Hugh Pitcher, Lynn Price, Keywan Riahi, Alexander Roehrl, Hans-Holger Rogner, Alexei Sankovski, Michael Schlesinger, Priyadarshi Shukla, Steven Smith, Robert Swart, Sascha van Rooijen, Nadejda Victor, Zhou Dadi



IPCC の IS92排出シナリオの評価

●著者: J. Alcamo, A. Bouwman, J. Edmonds, A. Gröbler, T. Morita, A. Sugandhy
●訳者: 森田恒幸, 村上奈穂子

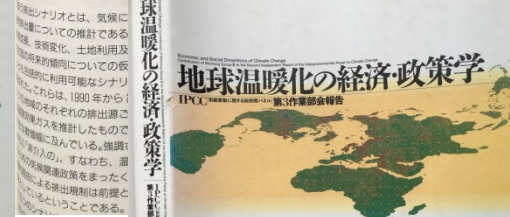
政策決定者のための要約

IS92排出シナリオとはにか¹ 評価するためには、複数のシナリオが提示する範囲を用いる必要がある。

IS92排出シナリオはどのように評価されたか

IS92排出シナリオは、気候に与える影響についての推計である。気候変動、土地利用及びその他の要因に関するシナリオはIPCCのシナリオである。また、科学的評価と政策シナリオの適正な使用について

IS92排出シナリオは、気候に与える影響についての推計である。気候変動、土地利用及びその他の要因に関するシナリオはIPCCのシナリオである。また、科学的評価と政策シナリオの適正な使用について



地球温暖化は、止むを得ない。地球温暖化問題の社会的経済的側面に焦点を当て、経済的手法による対応戦略を評価した。IPCC第二次評価報告書 第3作業部会報告書を全訳

Contribution of AIM to high-level decisions of Japanese climate policy

Year	Decision	Contribution	Memo
1997	Japanese 6% Reduction target for Kyoto Protocol	Provided negotiation team reduction options using IAM End use model	Debut of AIM, Sole IAM in Japan Adopted as in-house model of Environment Agency
2008	Japanese long-term reduction target for G8 Toyako Summit : Prime Minister Fukuda's Declaration of ' 2050 Japan Low Carbon Society '	Result of "Japan Low Carbon Society Scenarios toward 2050 Project-Possibility of 70% reduction"	Three time lectures to Environment Minister 2012→ The 4 th Environment Plan set 80% reduction target
2009	Japanese mid-term – reduction target for submission to UNFCCC/COP15	Options and their evaluation using AIM End-use/CGE/Impact	Cabinet Office invited 5 Models Still, AIM was only one IAM in Japan
2010 – 2012	Mid & long-term roadmap to achieve reduction target (Central Environment Council)	Long-term Prediction of emission compiled by AIM results of discussion by nearly 100 expert of 11 subgroups	
2011 – 2012	Energy-Environment strategy after Fukushima nuclear accident caused by Great East Japan Earthquake– (Cabinet Office)	Options of Nuclear share (in electricity) 0%, 15%, 20–25% compiled by AIM provided to nation wide deliberative poll	Result: •Strengthen energy saving •Prioritize RE •Reduce nuclear dependency 0% 15%, 20–25% Poll 47% 15% 13%
2020 – 2021	The 6 th mid-term energy plan and NDC (METI & MoE)	Feasibility of GHG net zero emission in 2050	First occasion invited to energy plan discussion

The Kyoto Controversy: Integrated system thinking vs. Sectoral inconsistent thinking

Main issues related to the AIM model

(in September 1997)

1. Assumption of crude steel production is too small.
2. Assumption of energy efficiency improvement of vehicles is too high.
3. Assumption of electricity production by electric utilities in 2010 is too small.
4. Assumption of carbon tax (30,000 yen/tC) is too expensive and unrealistic.

4

Mainichi Newspaper
October 7, 1997

EA model found
contradictory

Media: Lack of
understanding

EU criticized Japanese
proposal severely

STOP Global
Warming,
Kyoto, 1997

矛盾突かれた
環境庁モデル



通産主導 流れ崩れず

MITI-domination
unchecked



Mourning for Prof. Dr. Morita

1950-2003

1988—2003 15 years! He did a lot!

We have lost a great
lighthouse to guide us

IPCC chair

IPCC PANEL ON CLIMATE CHANGE



Mrs Morita
TOKYO
Japan

Potsdam, 4 September 2003

Dear Mrs Morita,

第13回「トヨト地球環境の殿堂」表彰
国立国際会館展示寄贈品として

at we received the tragic news of the sudden demise of
of. T. Morita. This information came when we were
adam at which he was to be present but for his illness.

is meeting we stood in silence at the beginning to pay
decided collectively to convey our shock and sense of

condolences on behalf of the IPCC and our feelings of

Yours sincerely,

R.K. Pachauri
Chairman



By Jun Morita

日本
低炭素社会
のシナリオ

二酸化炭素70%削減の道筋

西岡秀三 編

ここにある!
日本版グリーン
ニューディール



Dedication to Dr. Morita
for The Earth Hall of
Fame Kyoto

京都議定書に貢献された
故 森田恒幸氏に捧げる

西岡秀三と28人の仲間

G8 2008 HOKKAIDO TOYAKO SUMMIT

July 7-9 2008, Hokkaido, Japan



Prime Minister outlines green 'Fukuda Vision of Low Carbon Society Japan' on 9th June 2008 pledging to cut 60-80% of greenhouse gas emissions based on current levels by 2050 in Japan

Impossible Dream? or A Ray of Hope?

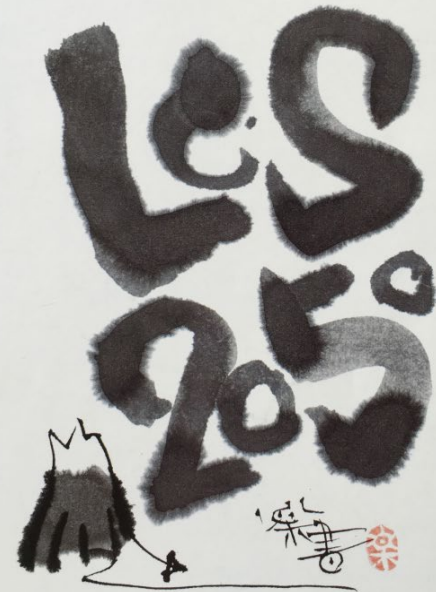
環境省地球環境研究総合推進費(S-3)「脱温暖化 2050プロジェクト」シンポジウム報告書
Global Environmental Research Fund (GERF/S-3)
Japan Low-Carbon Society (LCS) Scenarios toward 2050 Project Symposium

低炭素社会への道筋：日本とアジア

-「脱温暖化 2050 プロジェクト」研究成果発表会-

Path toward Low-Carbon Society : Japan and Asia

-Results from Japan Low-Carbon Society (LCS) Scenarios Study-



2009.2.12(Thu) 於：ホテルメトロポリタンエドモント
(Hotel Metropolitan Edmont, TOKYO)



Introduction of Japan LCS Research Project

Junichi Fujino (NIES), Japan LCS symposium, Feb 12, 2009, Tokyo



Japan LCS (Low-Carbon Society) (FY2004-2008)
Research Project supported by
Global Environmental Research Fund, MOE

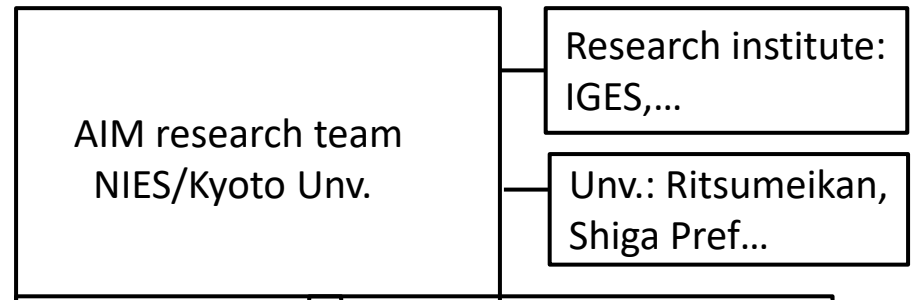
Creation of climate related policy science community

*Framing climate policy and role of AIM
COSMO Plan (1992)*

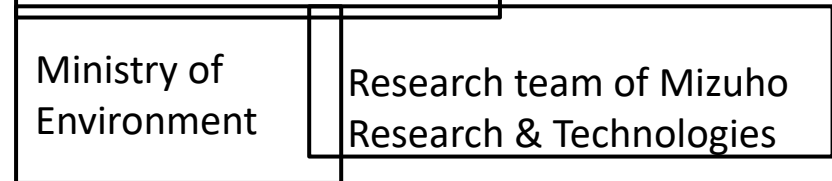


Achievement: Present status

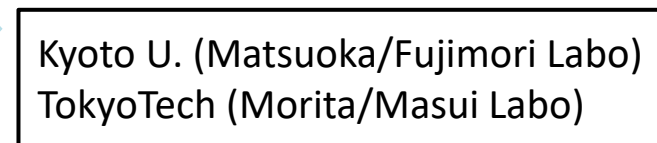
- Establish domestic policy science **research group for Japan-specific policy**, networked by linkage model



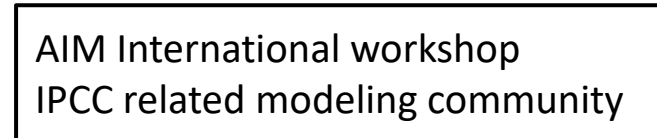
- Financial and organizational **research support**



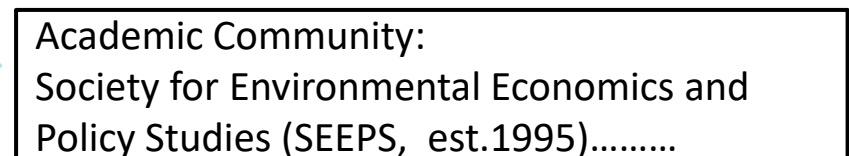
- Capacity development at **universities**



- Establish **international network** of policy science community. Formation of **invisible research institute** for fermenting international agreement



- **Enhance policy science**, economics, international relations and ethics & global environmental resource data base



3. Expansion of internal cooperation

1996 AIM Workshop started

The First AIM WS, 1996 NIES



and grown up



January 23-24, 2015

Ohyama Memorial Hall, NIES

Tsukuba, Japan

20th, 2015 NIES

IPCC Asia-Pacific Workshop on Integrated Assessment Model 1997, at UNU Tokyo

Overview of socio-economic models, J. Edmonds

Several gaps between IAM and D-ping co, T. Morita

- How adequately do IAM reflect socio-economic structure of developing countries? PR. Shukla

- Is it Possible to apply the same policy instruments to developing & developed countries? T. Jung

- How realistically do IAMs estimate climate change impacts in developing countries? Y. Matsuoka/ J. Sun

Major participants

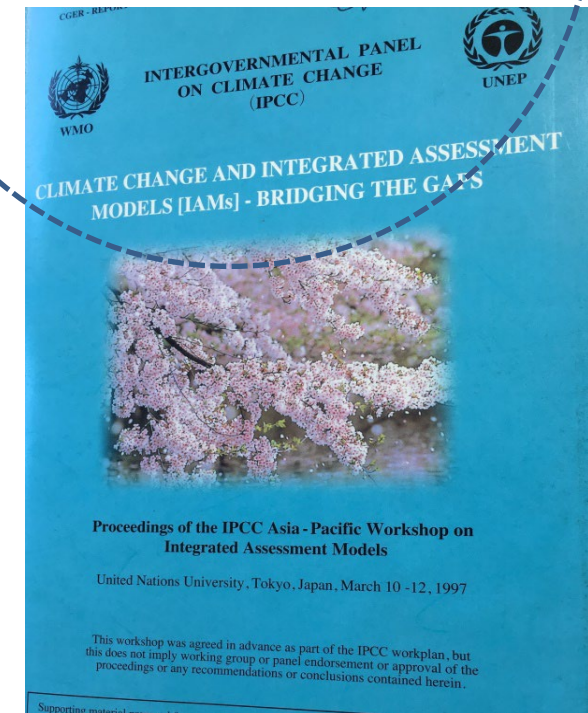
B. Bolin, H.S Lee
S. Schneider,
N. Nakicenovic, J. Wayent,
J. Alcomo, A. Amano...

Organizing Committee

H. Uzawa, J. Houghton, Y. Kaya
W. Nordhaus, H.J. Schlnhuber.
R. Watson...

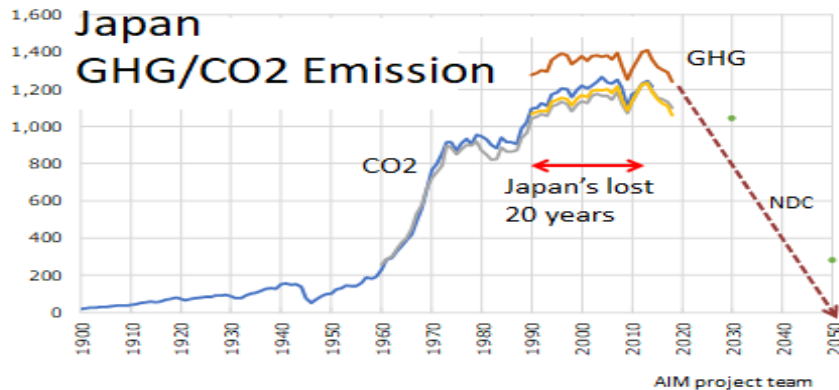
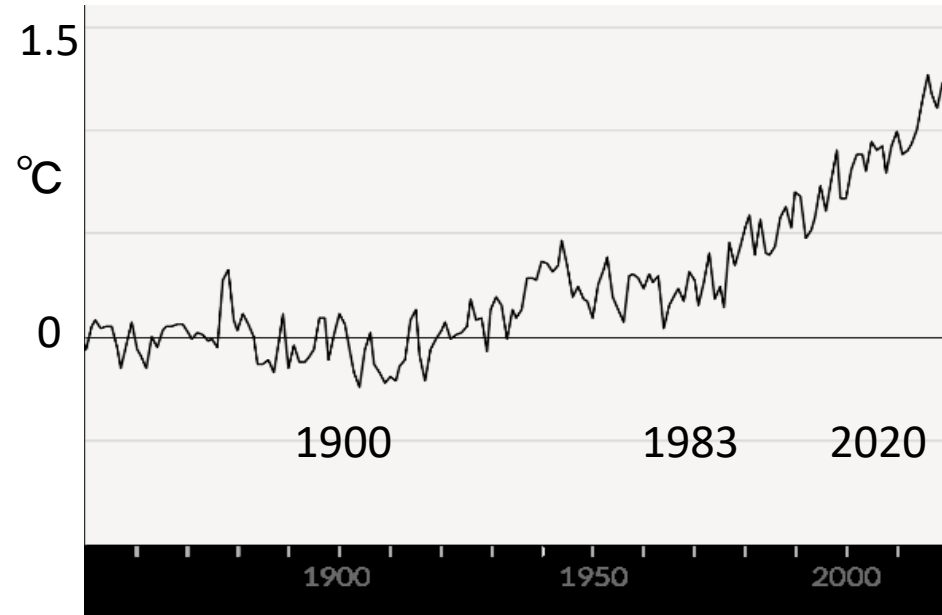
- 90 scientists from abroad
- 3 days with audience of 300

Secretary: NIE/CGER



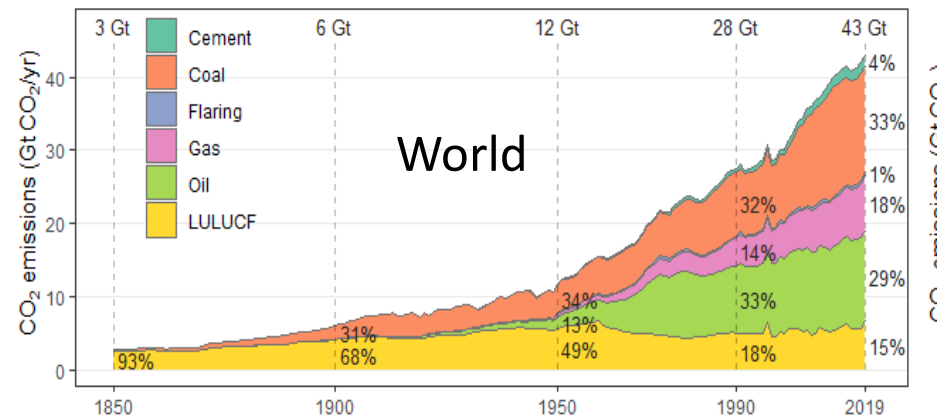
4. Future and unfinished business

Did We Delay A Greenhouse Warming?

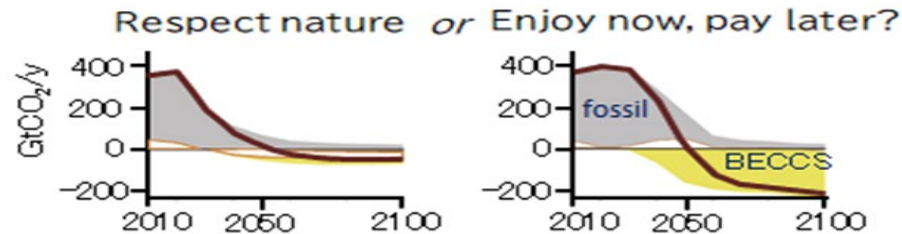


Increasing emissions

a. Long term trend of anthropogenic CO₂ emissions sources



Nature's suggestion for policy formation to stabilize climate: update(1)



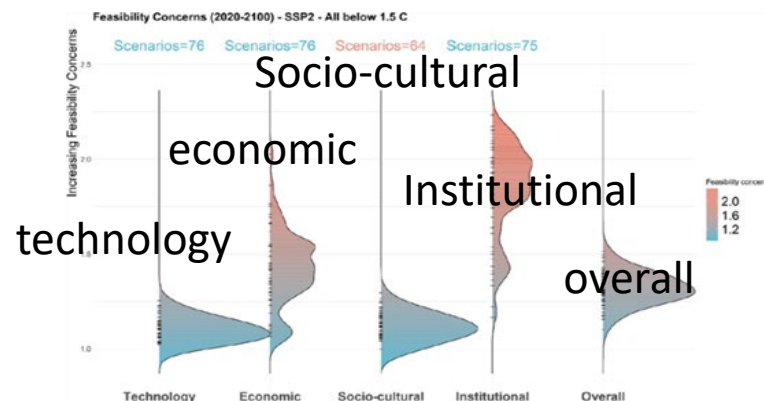
1. Solution & remaining time
 - net zero within 30-50 years
 - Immediate deep reduction inevitable
 - Enough technological potential with reasonable cost exists
 - Be cautious of depending too much on technological panacea
2. Carbon budget:
 - Don't waste scarce carbon budget
 - Mainstream decarbonizing policy in economic policy: green deal
3. Risk avoidance:
 - Climate changes are almost irreversible
 - Overshooting is highly risky. We haven't yet sure technology to reverse it
 - We can't adapt forever. Mitigation first, adaptation in parallel
4. Awe Nature:
 - Nature base solution is quite competitive with food production and eco-system
 - Low-likelihood CC outcomes cannot be ruled out
 - Possible cause of cascading change in tipping point

Nature's suggestion for policy formation to stabilize climate: update (2)

⑤ Barriers to transition

- Economic and institutional feasibility are high barriers in implementation

Barrier in implementation

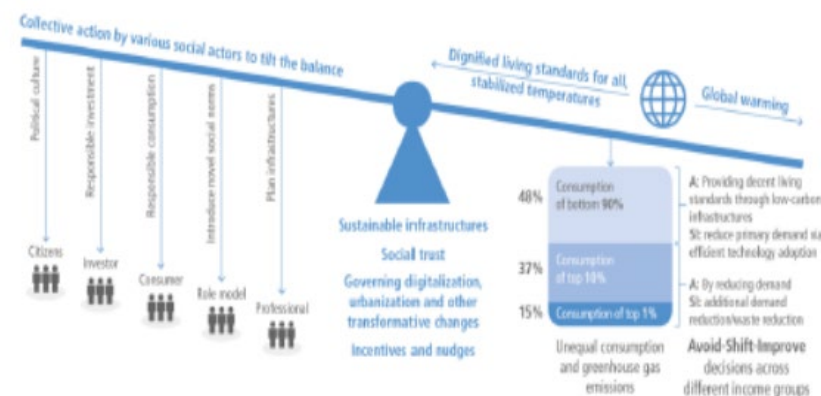


⑥ Demand-side strategies for mitigation

- restructuring climate policy by bottom up (demand-side) may have reduction potential of 40-70 %

Demand-side strategies for mitigation

(a) Tilting the balance towards less resource intensive service provisioning



⑦ Reforming current economic structure?

Thank you for your kind attention!!

Thirty years we studied
Thirty years we should act

Enjoy exciting & challenging
thirty years of big revolution

Respect nature and human beings

Good luck to you all, AIM Colleagues!

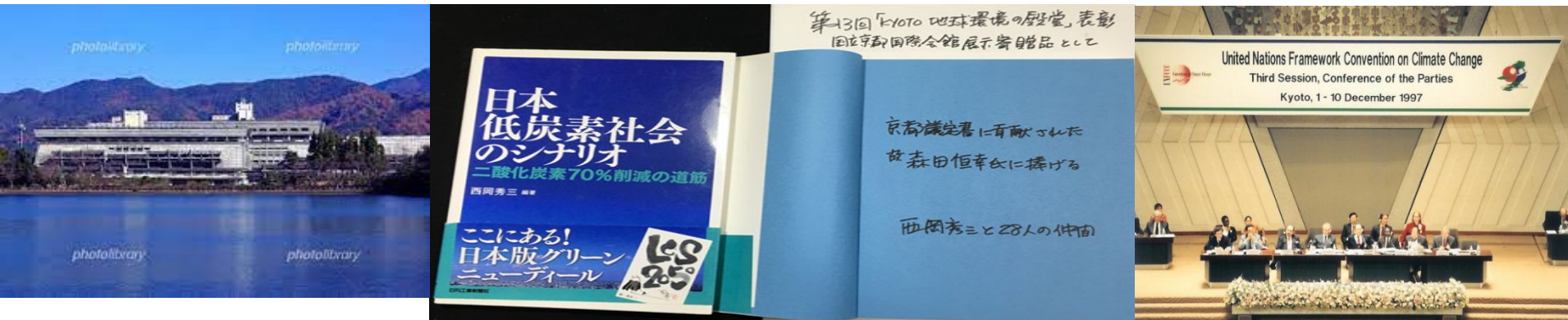
Thank you for your attention!!

Thirty years we studied
Thirty years we should act

Enjoy exciting & challenging
thirty years of big revolution

Respect nature and human beings

Good luck to you all, AIM Colleagues!



Dedication to Dr. Morita for the Earth Hall of Fame Kyoto



The Earth Hall of Fame Kyoto

