INNOVATION FOR THE GLOBE: JAPANESE LONG-TERM CLIMATE STRATEGY

Taishi Sugiyama
The Canon Institute of Global Studies (CIGS)
http://www.canon-igs.org/

*** Speaker is coordinated by GISPRI**

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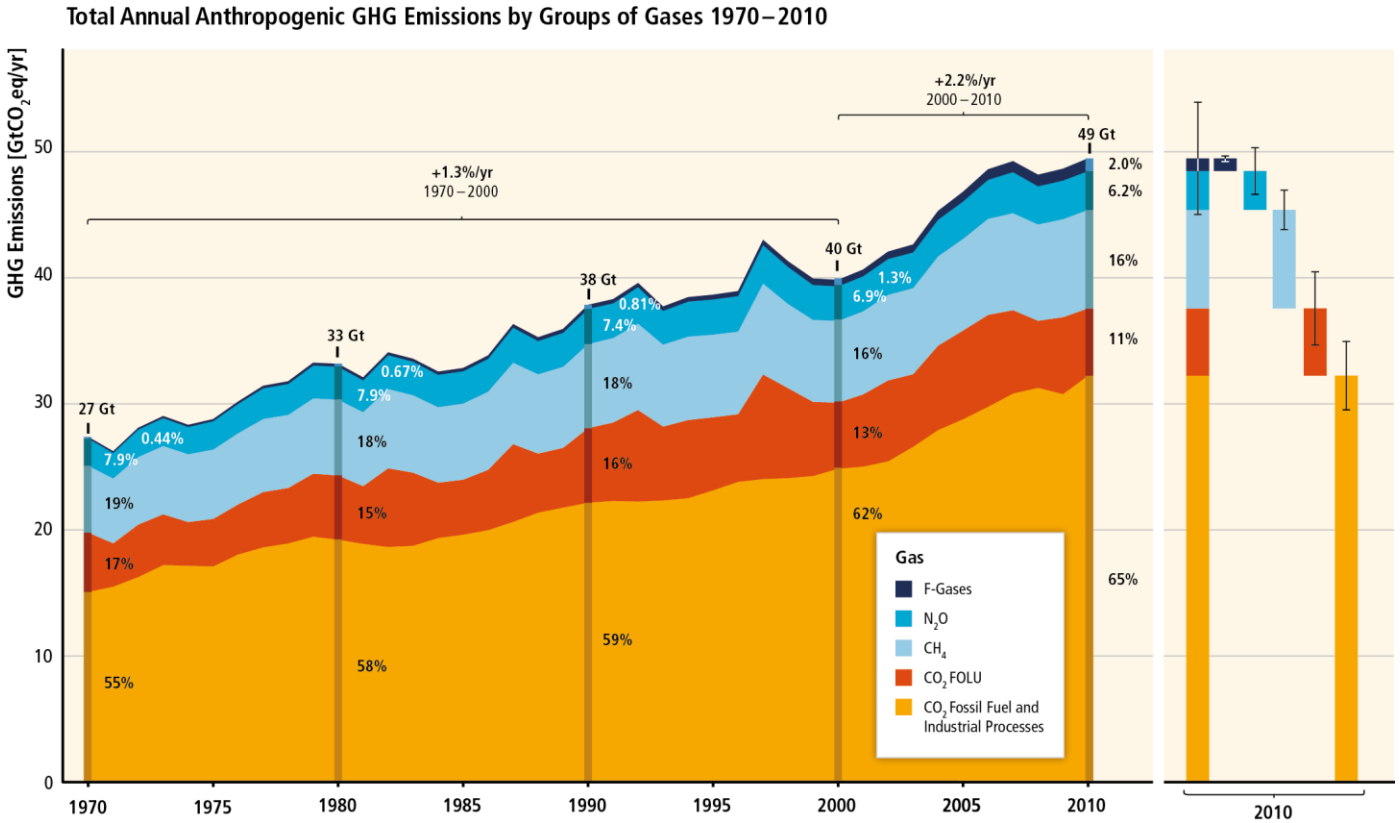
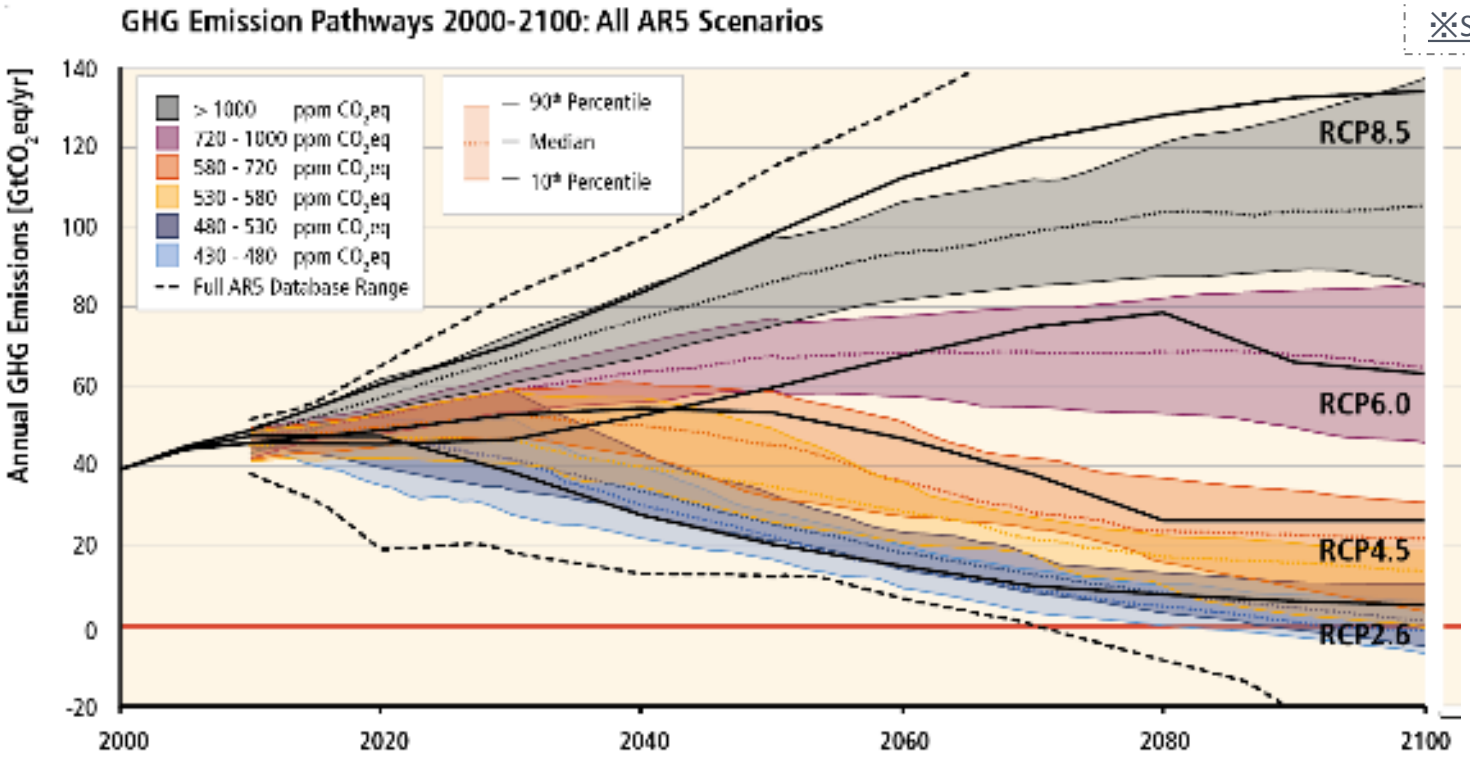
GHGS EMISSIONS INCREASING

The Canon Institute for Global Studies



※Source: IPCC

MASSIVE CUT REQUIRED



※Source: IPCC

Innovation plans & visions by Gov. of Japan

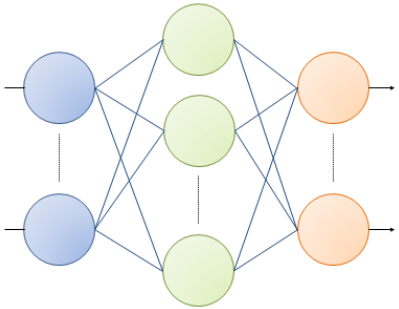
NATIONAL ENERGY & ENVIRONMENTAL STRATEGY FOR TECH. INNOVATION TOWARD 2015 (NESTI 2050; CABINET OFFICE))

- R&D program for innovative climate techs
- Key techs:

✓ Energy generation (PV, geothermal)
✓ Energy storage (battery)
✓ Energy efficiency (process, material)
✓ Carbon Capture & Use (CCU) ; and,

✓ System Integration (ICT, AI, big data, IOT)
✓ Core materials/devices for systems (superconductor, power electronics, censor)

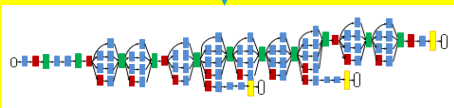
http://www.meti.go.jp/committee/summary/0004000/pdf/045_05_00.pdf Source: Cabinet Office



A Perceptron : Old AI

B Big data on web:
Used for machine learning

C Graphic Proc. Unit(GPU)
Tech of game machine



Deep Learning （Innovative AI）

A Non-climate use: eg. medical, manufacturing etc

B Direct CO2 cut with cobenefits
Eg. Energy efficiency of office

C Incur more innovation and cut CO2 indirectly, drastically
Eg. Self-driving car -> Car sharing -> EV

INNOVATION FORMULA

New techs = X * Y

X = common platform technology

ICT, IOT, AI, robot, big data, digital technology

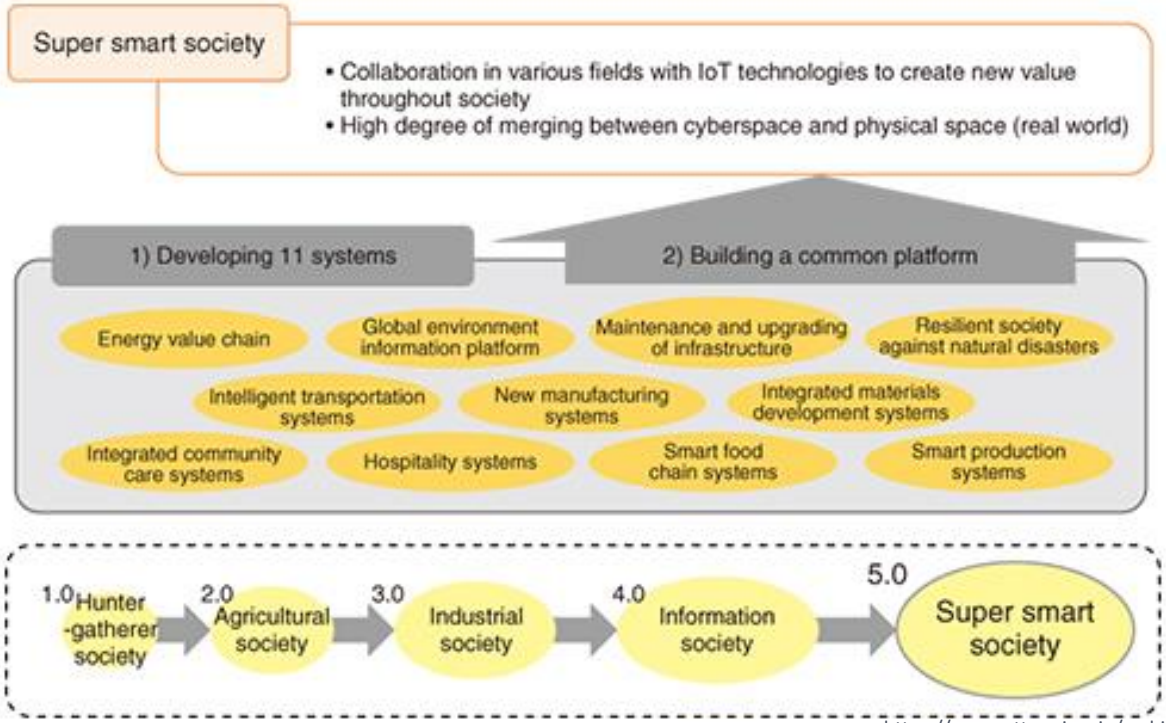
Y = existing economic area

finance, health, biology, energy,Manufacturing

“cognify” (Kelly 2016)

SOCIETY 5.0 (CABINET OFFICE)

Vision of "smart society" for *all* sectors



Source: METI

Source: Cabinet Office

https://www.ntt-review.jp/archive_html/201604/images/fa1_fig08.jpg

NEW INDUSTRIAL STRUCTURE VISION (METI)

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ICT Technology		Big Data		Goods and Services
Common platform technology (AI, IoT, robotics etc.)	Financial technology	Transactions, financial markets	=	Robo-Advisor (asset management), Credit by trading data, etc.
	Drug discovery technology	Health and medical data	=	Personalized medicines, Personalized cosmetic and beauty services etc.
	Bioinformatics Genome editing	Biological data	=	New drug discovery, new species crop, advanced materials manufacturing, bio-energy, etc.
	Energy load device control technology	Customer data	=	Energy demand response, monitoring services, etc.
	Production Control technology	Accidents and near-miss data	=	Early detection of abnormality, enhancement of insurance and credit rating etc.

Source: METI

- Vision of AI

✓ For three periods: -2020, 2020s, 2030-

✓ For many economic activities: machine learning, image cognition, robotics, self-driving, natural language, …

The Long-Term Climate Change Policy Platform

The Plan for Global Warming Countermeasures (Cabinet Decision)

Under the fair and effective framework of Paris Agreement in which ①all major countries participate, ②Japan will lead the international community such that major emitter countries tackle emissions reductions based on their capacity to do so. ③While achieving both global warming countermeasures and economic growth at the same time, **we aim to reduce GHG emissions by 80% before 2050, as a long-term target.**

Such a large scale reduction is difficult to achieve by continuing with conventional initiatives. Therefore, we will exert utmost effort to solve global warming problems through the research, development, and dissemination of innovative technologies. At the same time, we will encourage domestic investment and enhance international competitiveness, and seek opinions and wisdom broadly from the public, aiming for large-scale emissions reductions through long-term strategic initiatives. Through these efforts, we will contribute to emissions reductions for the entire world.

Summary of the Long-term Climate Change Policy Platform

April 7th, 2017
"Long-term Global Climate Change Policy Platform", METI

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◆ **Sustainable development** is the major objective of climate change policy. Reducing **GHG emissions on a global scale** is an absolute necessity.
◆ Although measures taken by Japan to date have been effective to a degree, **a country's own efforts can have only limited effect**.
◆ Therefore, the platform has set the **"three arrows" game changers** as its core strategy.

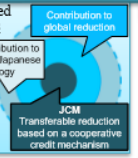
[1] The Three Arrows

(1) Toward Carbon Neutral through International Contribution

(1) As is: Japan contributes to global reductions with its excellent low-carbon technology based on ODA, JBIC and other public finance schemes as well as JCM. However, **only JCM has been visible as Japan's contribution.**

(2) To be: **We should maximize global reductions with all countries, including Japan, through a healthy competition of the amounts of visualized emission reduction contributions.**

(3) Potential Scale of Emission Reductions : **Around 2.9B tCO2 in 2030 and 9.7B tCO2 in 2050 (based on 10 developing countries in Asia, South America and Middle East** incl. JCM partners)



(2) Toward Carbon Neutral through Global Value Chains

(1) As is : **Japan's rich eco-system of industries** (materials, machinery, electronics, automobiles, infrastructure, etc.) has been creating innovative, high-performance products and technologies.

(2) To be : In product lifecycles, **emissions are greatest at the utilization stage**. As such, it is important to **broaden the view from reduction in factories to reduction throughout product lifecycles (value chains)**.

(3) Potential Scale of Reducing Emissions : Greater than equal to **1.0B tCO2 in 2020 and 1.6B tCO2 in 2030** globally (based on 7 industries' "The Commitment to a Low Carbon Society")

(3) Toward Carbon Neutral through Innovation

(1) As is : **The key to acting against climate change without sacrificing economic growth is the development of innovative technologies.**

(2) To be : **Japan formulated "National Energy and Environment Strategy for Technological Innovation towards 2050" (NESTI 2050) , identifying technological fields with potential to make huge impacts on emission reductions**. Japan will provide roadmaps for 10 of the identified fields, and also establish a platform on which the bottlenecks are to be identified under industry-academia-government collaboration.

(3) Potential Scale of Reducing Emissions: **Between several billion and 10 billion tCO_2** globally (based on target fields of NESTI 2050)

"Climate change policy over the entire globe"

– Making all players (countries, companies, individuals) carbon neutral –

[2] Issues and Facts Concerning the Three Game Changers

Strategy to co-exist with uncertainty *	Finance & investment	Carbon pricing	Support for international contribution
*Science, society, international circumstances ●**Major objective**: "Sustainable development" ●**Resilience**: "Implementation of non-regret action", "Seeking for strategic options" ●**Flexibility**: "Milestone", "The best course of action in a continuous PDCA cycle"	●Greater interest shown by financial community (engagement, green finance, etc.) ●Necessary to consider measures for positive cycle between investors and investees through disclosure and engagement, that are consistent with Japan's circumstances.	●Japan already has $40/t-CO2 energy tax in place. ●Necessary to consider international equilibrium, industrial competitiveness and consistency with existing domestic measures such as FIT.	●**Strengthen competitiveness of Japanese low-carbon technology:** Seamless support in global market(pilot projects (IoT related etc.), business environment). ●**Private-public cooperation:** Bilateral cooperation on CCS, NDCs implementation support.

Thank You

On the Long-Term Climate Change Policy Platform:
http://www.canon-igs.org/research_papers/energy/20170508_4317.html
(in Japanese only)

On the rapid innovation to mitigate global warming:
http://www.canon-igs.org/research_papers/energy/20170516_4329.html