

# INNOVATION FOR THE GLOBE: JAPANESE LONG-TERM CLIMATE STRATEGY

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\* Speaker is coordinated by GISPRI

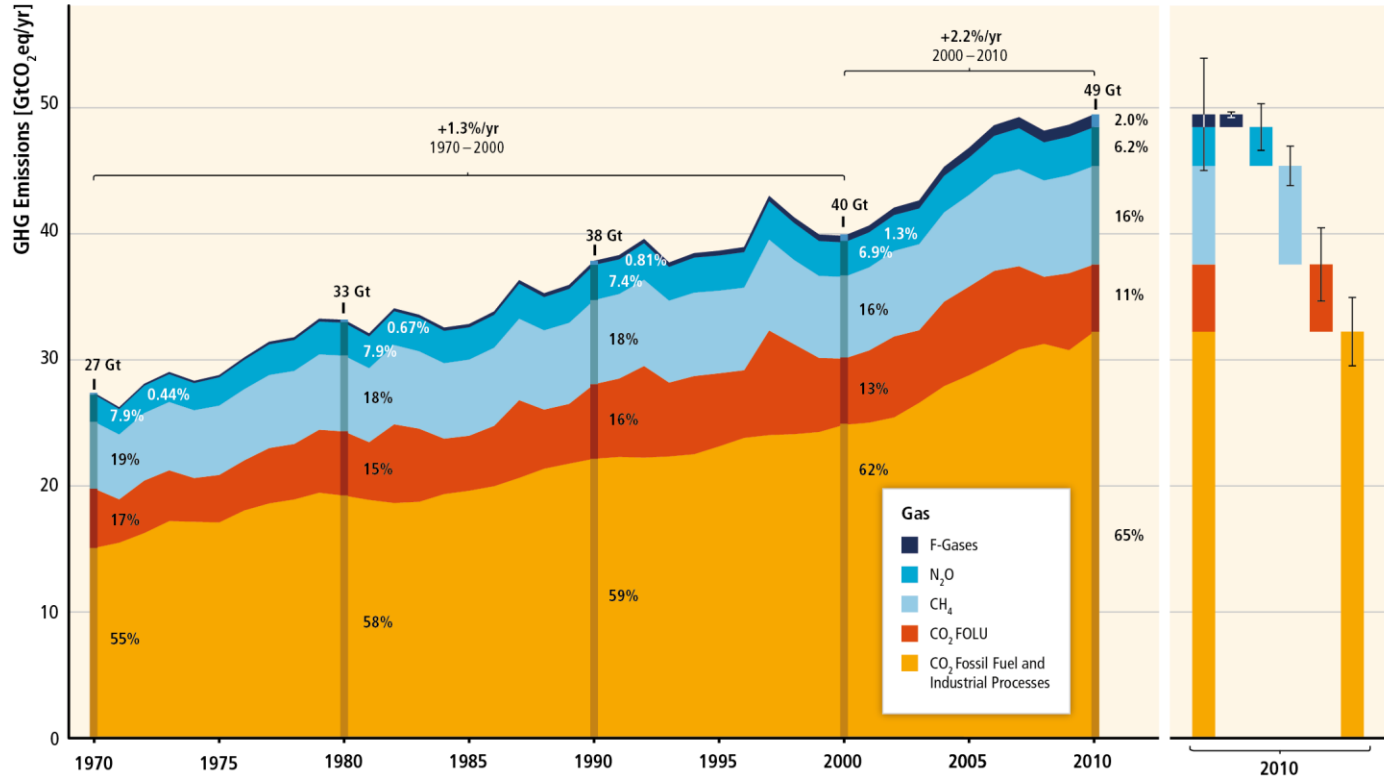
July 13, 2017

# GHGS EMISSIONS INCREASING



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Total Annual Anthropogenic GHG Emissions by Groups of Gases 1970–2010



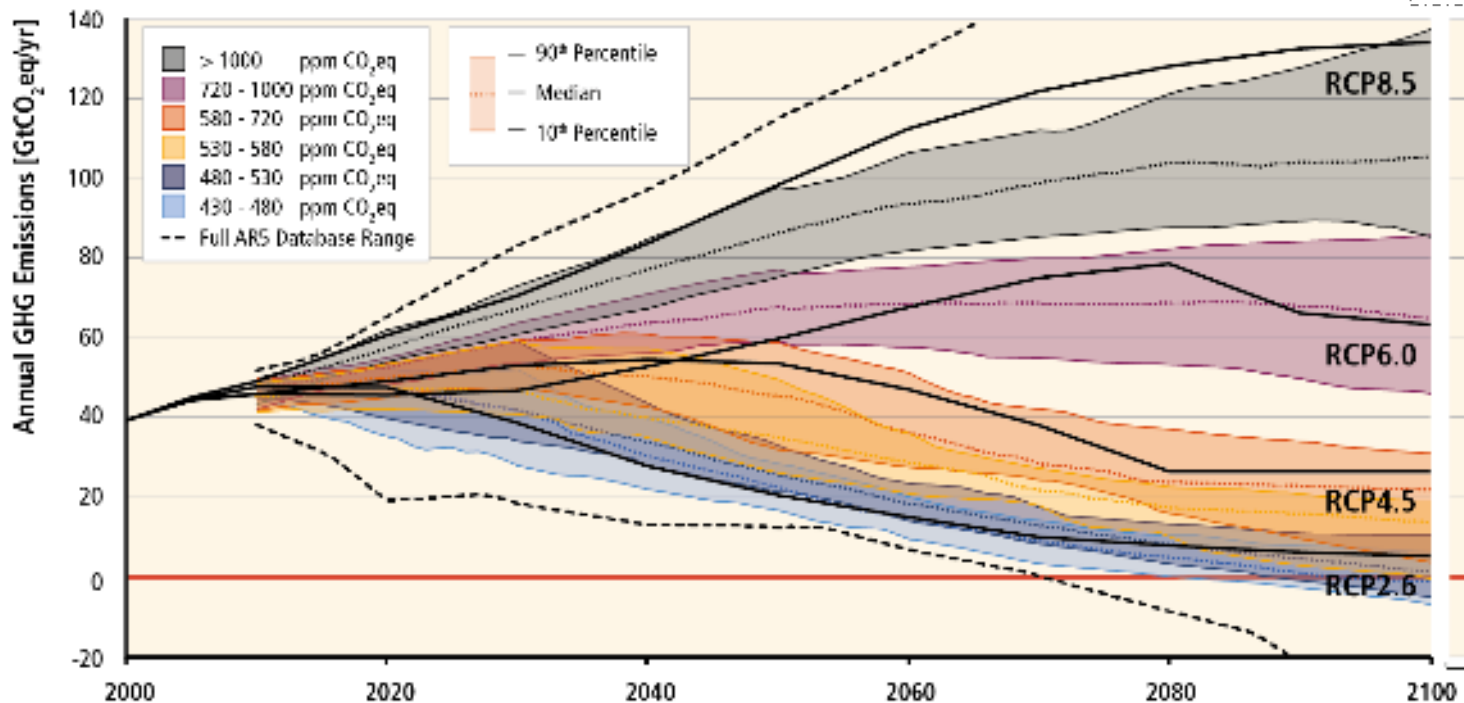
# MASSIVE CUT REQUIRED



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### GHG Emission Pathways 2000-2100: All AR5 Scenarios

Source: IPCC



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# Innovation plans & visions by Gov. of Japan



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



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- **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, sensor)

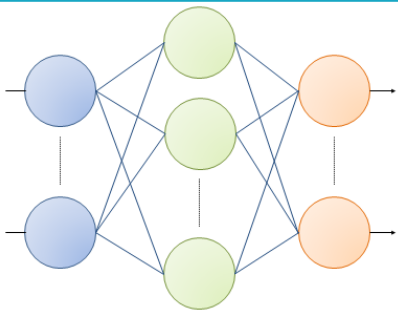
[http://www.meti.go.jp/committee/summary/0004000/pdf/045\\_05\\_00.pdf](http://www.meti.go.jp/committee/summary/0004000/pdf/045_05_00.pdf) Source: Cabinet Office



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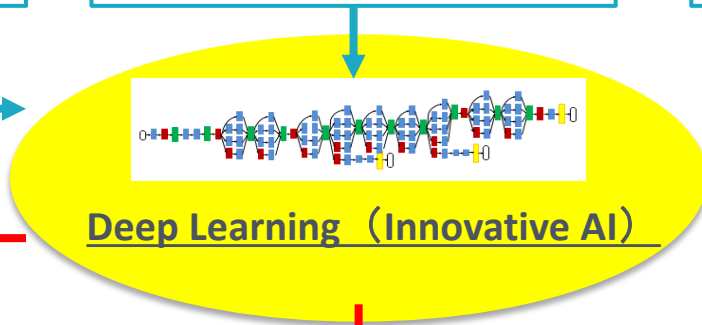
**A** Perceptron : Old AI



**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

**New techs = X \* Y**

X = common platform technology

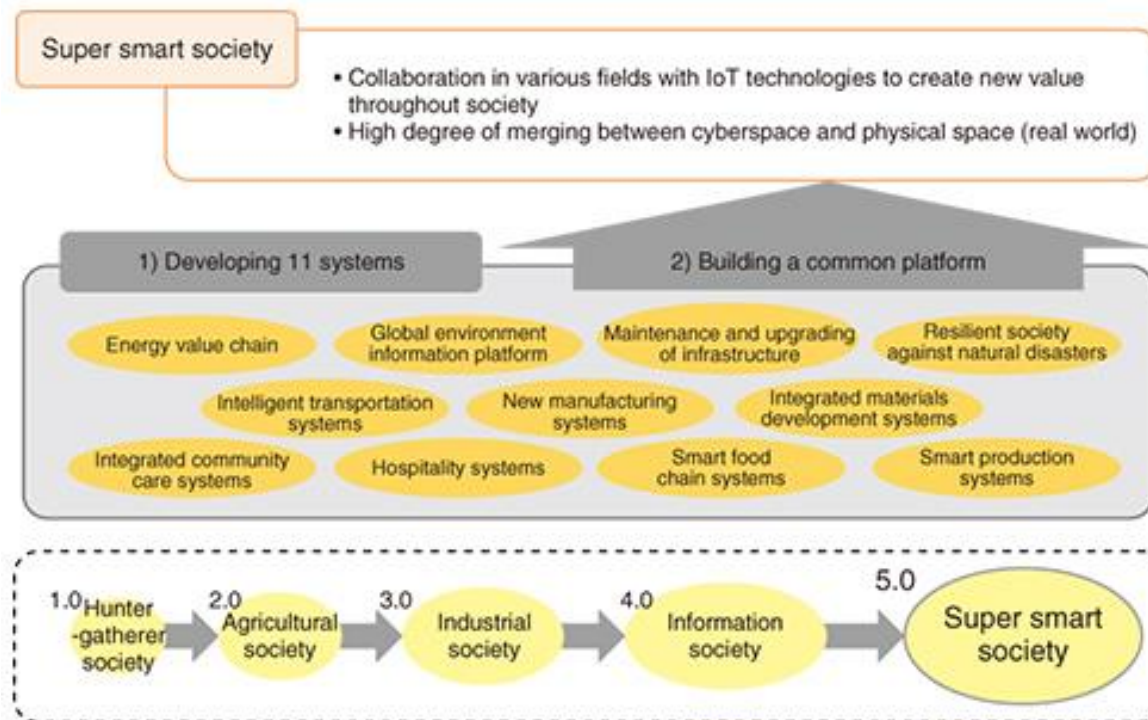
ICT, IOT, AI, robot, big data, digital technology

Y = existing economic area

finance, health, biology, energy, Manufacturing

“cognify” (Kelly 2016)

## Vision of “smart society” for *all* sectors

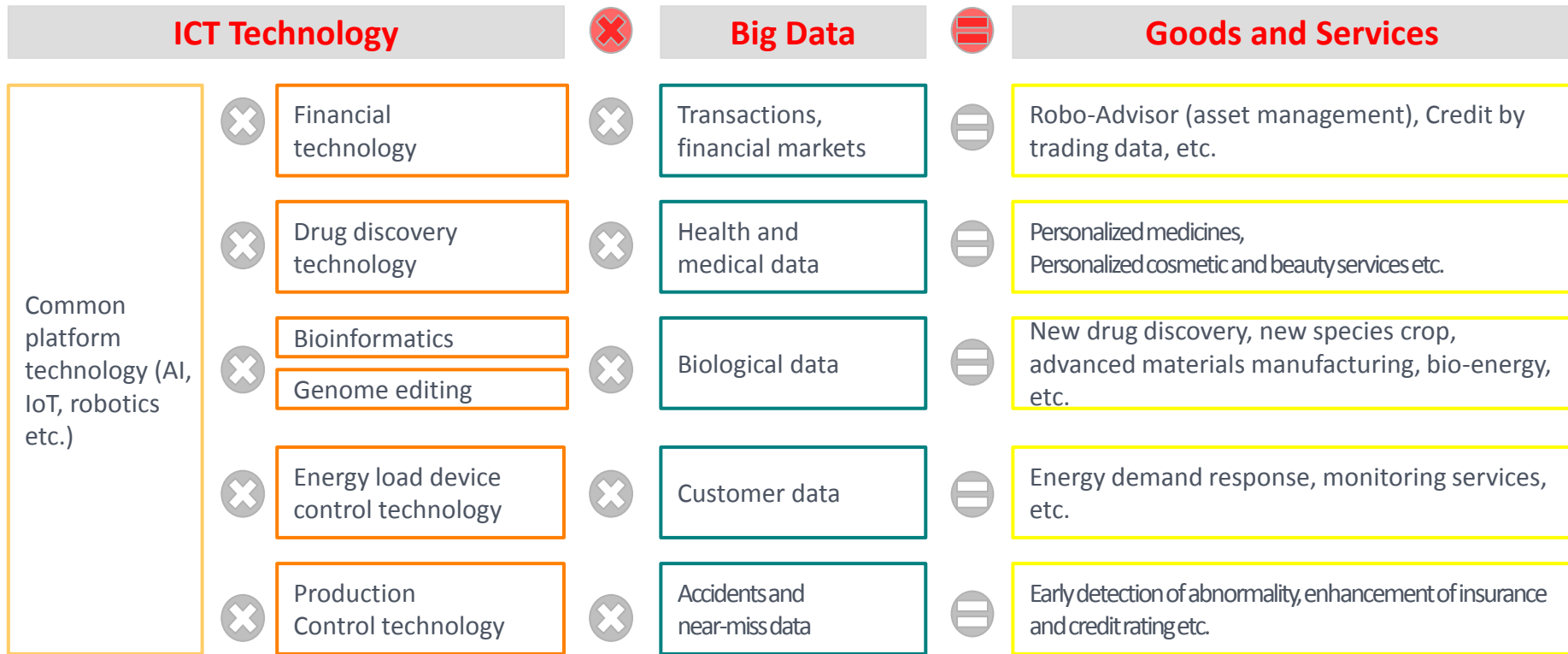


Source: METI

Source: Cabinet Office

[https://www.ntt-review.jp/archive\\_html/201604/images/fa1\\_fig08.jpg](https://www.ntt-review.jp/archive_html/201604/images/fa1_fig08.jpg)

# NEW INDUSTRIAL STRUCTURE VISION (METI)



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.

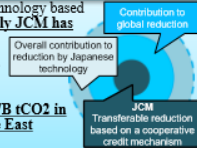


- ◆ **Sustainable development** is the major objective of climate change policy. Reducing **GHG emissions on a global scale** is an absolute necessity.
- ◆ Although measures taken by Japan to date have been effective to a degree, **a country's own efforts can have only limited effect.**
- ◆ Therefore, 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 tCO<sub>2</sub> in 2030 and 9.7B tCO<sub>2</sub> in 2050 (based on 10 developing countries in Asia, South America and Middle East incl. JCM partners)**



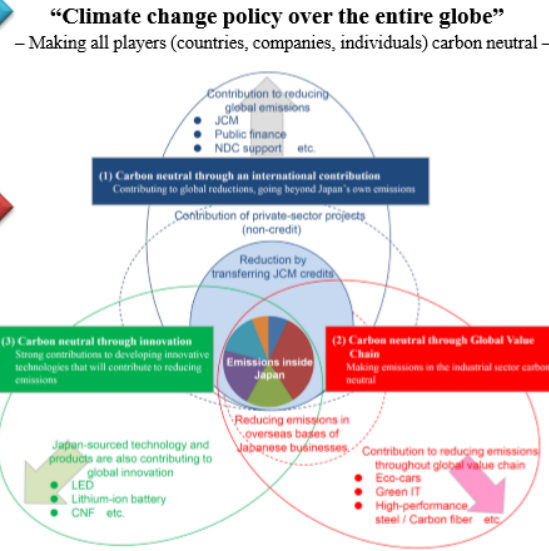
### (2) Toward Carbon Neutral through Global Value Chains

- (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 tCO<sub>2</sub> in 2020 and 1.6B tCO<sub>2</sub> 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<sub>2</sub>**, globally (based on target fields of NESTI 2050)



## 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 ● <b>Major objective:</b> “Sustainable development” ● <b>Resilience:</b> “Implementation of non-regret action”, “Seeking for strategic options” ● <b>Flexibility:</b> “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-CO <sub>2</sub> 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](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](http://www.canon-igs.org/research_papers/energy/20170516_4329.html)